March, 1943

GEOGRAPHY, RESOURCES & INDUSTRIES
MAR 10 1943

EDISON ELECTRIC INSTITUTE BULLETIN

CONTENTS

Economics of War Power Supply . . . . . C. W. KELLOGG 65

War and Customer Service . . . . . P. S. ARKWRIGHT 68

How Should We Advertise in 1943? . . . . . KENNETH L. EDE 69

Domestic Electric Service in 1942 . . . . . W. M. CARPENTER 73

A Test Case Showing the Computation of Depreciation Under the Group Plan by the Asymptotic Method . . . HAROLD G. AVERY 75

Lively Interest in Current Problems Marks Meeting of Transmission and Distribution Committee . . . . . E. V. SAYLES 79

Suggestions for Air Raid Wardens 82

Accident Prevention Committee Holds Winter Meeting . . . . . GEORGE S. DIEHL 83

More Edison Medal Awards for Resuscitation . . . MAE B. WOODS 85

How Georgia Power Company Is Expanding Service Program to Meet Wartime Needs . . . . . JOHN H. STEVENS 90

Personals 91

Conventions and Meetings, 92

THE ELECTRIC LIGHT AND POWER INDUSTRY

WEEKLY ELECTRIC OUTPUT IN KILOWATT HOURS — 1940, 1941 AND 1942

1942		1941		% 1942 Over 1941	1940		% 1941 Over 1940
Jan 3	3,288,685,000	Jan 4	2,845,727,000	+15.6	Jan 6	2,558,180,000	+11.2
" 10	3,472,579,000	" 11	3,002,454,000	+15.7	" 13	2,688,380,000	+11.7
" 17	3,450,468,000	" 18	3,012,638,000	+14.5	" 20	2,673,823,000	+12.7
" 24	3,440,163,000	" 25	2,996,155,000	+14.8	" 27	2,660,962,000	+12.6
" 31	3,468,193,000	Feb 1	2,994,047,000	+15.8	Feb 3	2,632,555,000	+13.7
Feb 7	3,474,638,000	" 8	2,989,392,000	+16.2	" 10	2,616,111,000	+14.3
" 14	3,421,639,000	" 15	2,976,478,000	+15.0	" 17	2,564,670,000	+16.1
" 21	3,423,589,000	" 22	2,985,585,000	+14.7	" 24	2,546,816,000	+17.2
" 28	3,409,907,000	Mar 1	2,993,253,000	+13.9	Mar 2	2,568,328,000	+16.5
Mar 7	3,392,121,000	" 8	3,004,639,000	+12.9	" 9	2,553,109,000	+17.7
" 14	3,357,444,000	" 15	2,983,591,000	+12.5	" 16	2,550,000,000	+17.0
" 21	3,357,032,000	" 22	2,983,048,000	+12.5	" 23	2,508,321,000	+18.9
" 28	3,345,502,000	" 29	2,975,407,000	+12.4	" 30	2,524,066,000	+17.9
Apr 4	3,348,608,000	Apr 5	2,959,646,000	+13.1	Apr 6	2,493,690,000	+18.7
" 11	3,320,858,000	" 12	2,905,581,000	+14.3	" 13	2,529,908,000	+14.8
" 18	3,307,700,000	" 19	2,897,307,000	+14.2	" 20	2,528,868,000	+14.6
" 25	3,273,190,000	" 26	2,950,448,000	+10.9	" 27	2,499,060,000	+18.1
May 2	3,304,602,000	May 3	2,944,906,000	+12.2	May 4	2,503,899,000	+17.6
" 9	3,365,208,000	" 10	3,003,921,000	+12.0	" 11	2,515,515,000	+19.4
" 16	3,356,921,000	" 17	3,011,345,000	+11.5	" 18	2,550,071,000	+18.1
" 23	3,379,985,000	" 24	3,040,029,000	+11.2	" 25	2,588,821,000	+17.4
" 30	3,322,651,000	" 31	2,954,647,000	+12.5	Jun 1	2,477,689,000	+19.3
Jun 6	3,372,374,000	Jun 7	3,076,323,000	+ 9.6	" 8	2,598,812,000	+18.4
" 13	3,463,528,000	" 14	3,101,291,000	+11.7	" 15	2,664,853,000	+16.4
" 20	3,433,711,000	" 21	3,091,672,000	+11.1	" 22	2,653,788,000	+16.5
" 27	3,457,024,000	" 28	3,156,825,000	+ 9.5	" 29	2,659,825,000	+18.7
Jul 4	3,424,188,000	Jul 5	2,903,727,000	+17.9	Jul 6	2,425,229,000	+19.7
" 11	3,428,916,000	" 12	3,178,054,000	+ 7.9	" 13	2,651,626,000	+19.9
" 18	3,565,367,000	" 19	3,199,105,000	+11.4	" 20	2,681,071,000	+19.3
" 25	3,625,645,000	" 26	3,220,526,000	+12.6	" 27	2,760,935,000	+16.6
Aug 1	3,649,146,000	Aug 2	3,263,082,000	+11.8	Aug 3	2,762,240,000	+18.1
" 8	3,637,070,000	" 9	3,233,242,000	+12.5	" 10	2,743,284,000	+17.9
" 15	3,654,795,000	" 16	3,238,160,000	+12.9	" 17	2,745,697,000	+17.9
" 22	3,673,717,000	" 23	3,230,750,000	+13.7	" 24	2,714,193,000	+19.0
" 29	3,639,961,000	" 30	3,261,149,000	+11.6	" 31	2,736,224,000	+19.2
Sep 5	3,672,921,000	Sep 6	3,132,954,000	+17.2	Sep 7	2,591,957,000	+20.9
" 12	3,583,408,000	" 13	3,322,346,000	+ 7.9	" 14	2,773,177,000	+19.8
" 19	3,756,922,000	" 20	3,273,375,000	+14.8	" 21	2,769,346,000	+18.2
" 26	3,720,254,000	" 27	3,273,376,000	+13.7	" 28	2,816,358,000	+16.2
Oct 3	3,682,794,000	Oct 4	3,330,582,000	+10.6	Oct 5	2,792,067,000	+19.3
" 10	3,702,299,000	" 11	3,355,440,000	+10.3	" 12	2,817,465,000	+19.1
" 17	3,717,360,000	" 18	3,313,596,000	+12.2	" 19	2,837,730,000	+16.8
" 24	3,752,571,000	" 25	3,340,768,000	+12.3	" 26	2,866,827,000	+16.5
" 31	3,774,891,000	Nov 1	3,380,488,000	+11.7	Nov 2	2,882,137,000	+17.3
Nov 7	3,761,961,000	" 8	3,368,690,000	+11.7	" 9	2,858,054,000	+17.9
" 14	3,775,878,000	" 15	3,347,893,000	+12.8	" 16	2,889,937,000	+15.8
" 21	3,795,361,000	" 22	3,247,938,000	+16.9	" 23	2,839,421,000	+14.4
" 28	3,766,381,000	" 29	3,339,364,000	+12.8	" 30	2,931,877,000	+13.9
Dec 5	3,883,534,000	Dec 6	3,414,844,000	+13.7	Dec 7	2,975,704,000	+14.8
" 12	3,937,524,000	" 13	3,475,919,000	+13.3	" 14	3,003,543,000	+15.7
" 19	3,975,873,000	" 20	3,495,140,000	+13.8	" 21	3,052,419,000	+14.5
" 26	3,655,926,000	" 27	3,234,128,000	+13.0	" 28	2,757,259,000	+17.3
Jan 2	3,779,993,000	Jan 3	3,288,685,000	+14.9			

Vol. 11, No. 3, EDISON ELECTRIC INSTITUTE BULLETIN; published monthly. Entered as second-class matter Aug. 17, 1933, at the post
at Philadelphia, Pa., under the act of March 3, 1879. Publication office, 56th and Chestnut Sts., Philadelphia, Pa. Editorial offic
Lexington Ave., New York, N. Y. Subscription rate $2.00 per year in the United States; $3.00 per year in foreign cou

The Edison Electric Institute does not assume responsibility for, nor neces sarily endorse or approve, statements made by contributors to the Bu

DISON ELECTRIC INSTITUTE BULLETIN

lume 11 MARCH, 1943 No. 3

Economics of War Power Supply

By C. W. Kellogg
President, Edison Electric Institute

An address before the Western Massachusetts Engineering Society, Springfield, Mass., Feb. 16, 1943

URING the year 1942 the electric energy produced by all agencies, both private and governmental, contributing to the public ly was 188,850,000,000 kwhr. The bined demand on the facilities proing this energy during the highest of the 8760 in the year was 36,000 kw. This demand was about 000,000 kw less than the combined rating capacity—a margin that had eased by about 1,000,000 kw during year. Contrasted with the condis surrounding many basic materials, ch have had to be severely rationed to there being not enough to go nd, there was no rationing of electy and no shortage of it. This showwas made in the face of the greatest strial war effort ever put forth by country. My purpose today is to uss the economics of this situation; conclusion is that the results appear al from an economic viewpoint.

Stability Inherent in Breadth of Coverage

he breadth of coverage of the elec- utility business in this country is nigh inconceivable. At the end of 2 it was serving over 32¼ million omers and serving most of them with ed nearly as basic as life itself. So t is the number of small users that, though each uses but a small unt of power, the great industries only a little over a half of the total gy sold.

Power for Industry

would be natural to assume, from great war activity on the one hand the dimout and other restrictions ighting on the other, that the power e of the electric utility business was only the preponderant part of it but prised a much larger proportion of the total now than formerly. This was not the case. In 1942 Industrial Power comprised 56.0 per cent of the total energy sold. In 1926 and again in 1929 that ratio was 57.1 per cent. In general the record shows that the ratio always runs highest during periods of greatest industrial activity, but at that it was 2 per cent less in 1942 than in 1929. The point I wish to stress is that on the grand total of power requirements the effect of the tremendous war activity was merely what would be expected from any business boom.

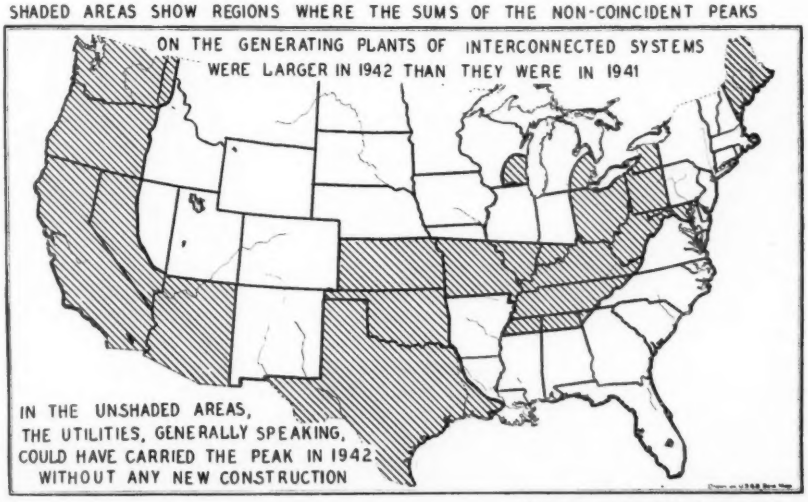
Growth

The net growth in installed electric generating capacity in 1942, amounting to 2,585,000 kw, was the largest of any year but one in the history of the industry. That other year was 1925—17 years earlier—when the net increase was 4,019,000 kw. On a relative basis, however, that is, in the per cent increase over the then existing capacity, the year 1942 was topped by every one of the eight years from 1923 to 1930, both inclusive, the average annual per cent increase in those eight years being half again greater than it was in 1942. It is always easier to talk accurately about something that has occurred than to speculate accurately upon something in the future, especially when the future appears to involve conditions not experienced in the past—hindsight is easier than foresight. It is instructive at this time to follow through the reasoning that was applied to the War Power Problem as it developed from the earliest days of the Defense Preparedness Process.

There have been several approaches to the War Power Problem. Each has had what appeared at the time it was adopted a sound basis, but some failed

DISTRIBUTION OF THE INCREASE IN PEAK LOADS, 1942

SHADED AREAS SHOW REGIONS WHERE THE SUMS OF THE NON-COINCIDENT PEAKS ON THE GENERATING PLANTS OF INTERCONNECTED SYSTEMS WERE LARGER IN 1942 THAN THEY WERE IN 1941


IN THE UNSHADED AREAS,
THE UTILITIES, GENERALLY SPEAKING,
COULD HAVE CARRIED THE PEAK IN 1942
WITHOUT ANY NEW CONSTRUCTION

EDISON ELECTRIC INSTITUTE

to think the matter through to a conclusion; that is, they failed to take account of all contingencies.

The first was to study the size and nature of the various items of war production required and then to apply to each the known amount of power required per unit of production. Such a computation led to really formidable totals. For a while the assumption was that these amounts of power had to be produced over and above existing requirements—that new generating capacity capable of producing them would have to be forthcoming.

This line of reasoning overlooked the fact that the magnitude of industrial power requirements is necessarily incidental both to the amount of raw materials upon which it operates and to the manpower required to do the work. Economic forces have always kept the supply of materials down to about the level of demand; there has on the whole never been percentage-wise much more of the raw materials of industry than was needed for current production. This followed inevitably from the fact that nothing is produced much beyond the point of filling orders for the material in question.

Limitations in Supply of Materials

Whatever the reason, however, it was very early in the war preparedness program that the demands of that program meant a direct competition, for a relatively limited supply of materials, between war preparedness and civilian activities. "Priorities," as a subject for special treatment by the Defense Commission, came up first in the autumn of 1940, at a time when the monthly war expenditures of the government were one-twentieth their present current level. With the reorganization of the Defense Commission into OPM at New Year 1941, priorities had in the few months interim become of such paramount importance that it was made one of the main divisions in the new organization. But even at that time, preparedness expenses were only 1/12th what they are running today.

Momentum of Civilian Activity

In spite of this very early emergence in the War Preparedness Program of a demand far exceeding the supply of materials, the natural momentum of the great economic mechanism of as great a country as ours was such that civilian economy tended to carry on long after it should have shrunk up to yield to war pressure. The result of this momentum was for the war preparedness effort initially to be superimposed upon the mass of civilian effort; and this gave color to the belief, held by some even up to Pearl Harbor or later, that war production would of itself require corresponding increases in power production facilities.

For example, it was 1¼ years after the Defense Commission was set up that there occurred the greatest increase in industrial electric energy output over the corresponding month of the preceding year. In that month, September, 1941, industrial energy output was 1,656,000,000 kwhr over 1940, which amounted to about 1.39 kwhr for each dollar of increase in war preparedness expense. It was in that summer (July, 1941) and evidently based on the conditions I have mentioned, that the Federal Power Commission forecast power demands by the end of 1942 which were 6,673,000 kw (or 20 per cent) greater than they later proved actually to have been when the record for 1942 was closed.

Superposition Theory Fallacious

With the further progress of the war production program it became clear that the superposition theory of war power on top of civilian power was fallacious, for the larger the war expenditures grew the smaller became the increase in energy requirements per dollar increase in such expenditures, as will be shown later. Six months after Pearl Harbor the ratio had dropped to less than one-sixth what it had been a year earlier.

Industrial Employment Not Dependable Criterion

As the undependability of the early estimates of the ratio between war industrial output and industrial electric energy gradually became apparent, recourse was had to the number of people employed as a criterion of total power requirements. In this case also the analogy which appeared at first to exist did not carry through. The results of the last two years indicate that the relation between peak loads and number employed is not constant but is a constantly dropping one. The use of the ratio between industrial employees and industrial electric power capacity which existed in 1939 and 1940 produced an error on the high side for 1942 of at least 6,000,000 kw. A recent study by months of industrial employment and electric power peak loads country wide shows how this situation has developed and reflection upon the nature of the war loads explains why. At the end of 1939 the kilowatts of peak load per industrial ployee was 3.06. In the middle of following year the defense prepara began, calling in some cases for mul shift operation, under which natu two or more employees used the kilowatt. By the end of 1940 the had dropped 2 per cent. The pr continued thereafter as the war grew in size and intensity; by the of 1941 the ratio was 7 per cent b 1939 and at the end of 1942 it was 16 per cent, a drop which accounts pletely for the 6,000,000 kwhr er have mentioned as arising from usin dustrial employment as the measu power capacity requirements.

Total Industrial Production Appears Valid Test

The conclusion which the war rience through 1942 seems to de strate is that electric energy re ments really follow most closely the ume of industrial production. This carries through in an unbroken cha a continuous period of five years e with 1942, a period covering the t tion from peace to maximum war e Reflection will show why this is l to expect. As was pointed out e electric energy requirements for m facturing are not a thing in them but are the resultant of industrial a ity; and industrial activity in tu rigidly limited by the materials which it can be applied. This limit being a physical one, is independe peace or war—if war demands in as they have done, they can be me by a corresponding draft on civili tivities. Naturally the stimulus and sure of war demands produce greater output of the raw materia I plan to discuss later) but the war plus civilian, is limited in the ner I have stated.

Displacement of Manpower

The erroneous conclusions as to requirements that can result from centrating one's attention on war alone is exemplified also in the ma manpower. From December, 19 December, 1942, the number o workers grew from 6,900,000 t 500,000, an increase of 10,600,0 154 per cent. Considered by it would have seemed like an imp task to assemble this number o workers while in addition 7,000,0 were taken into the armed forces. really happened was principally of manpower from civilian to war as shown by the fact that the tot

loyment in manufacturing, mining and nstruction (in this case from Novem-r, 1941, to November, 1942, U. S. Department of Labor Release of Jan. 1, 943) increased but 9 per cent, from 6,634,000 to 18,139,000; and this oc-arred in a period when monthly war xpenditures grew 311 per cent—from 532 to 6292 million dollars.

Example of Steel

Perhaps an even more striking illus-ration of transition from peace to war ould be shown by the steel industry. very war machine—guns, ships, both aval and transport, tanks, war plant onstruction and so on through a long st—require steel in enormous quanti-es, yet the monthly steel production has en but 7 per cent in the last two years. am not intimating that the steel indus-y has not complied fully with the re-irements of the war program for that ential basic material, for they have ne so in a striking way. I am merely ing this great basic industry as an-her example of how war takes from ilian with relatively small change in nd totals.

Coal

The stability of the steel industry ses from the fact that it serves basical-all other industries. A similar situa-n exists with respect to bituminous l. Production in 1942 was 577 mil-n tons. To correct this for compari-of consumption with 1941 it should reduced by the increase in storage in 2 compared to 1941, this increase ounting to 27 million tons and mak-the comparable figure for 1942, 0 million tons. This latter figure is 7.8 per cent above the comparable re of 510 million in 1941. This is the same order of magnitude as the owth in the combined non-coincident ximum load on electric systems con-ributing to the public supply of the ion, which went from 35.1 to 36.9 lion from 1941 to 1942, or 5.1 per t increase.

Munitions

As an economic phenomenon, the rela-stability of these basic measurements total national activity, civilian and combined, becomes even more strik-when considered in the light of the tic changes that have occurred in ific industries. The index of the out-of munitions as a whole (which in-es ships, planes, tanks, guns, ammu-n and all field equipment) was ly four times as great at the end of 2 as at the end of 1941—a 273 per cent increase for the whole group. Naturally individual industries in the munitions group have shown even more spectacular rates of growth than has the group as a whole.

War Expenditures Flattening Out

Even in a war effort as great as our own (and nothing of its magnitude has ever been made by any nation at any time) there comes a time when a peak is reached and the volume of expenditure begins to drop off. There are various reasons for this. One is that a substantial part of the expenditures to date have consisted in the construction and tooling of new plants for doing specific war work. These expenditures once made do not have to be repeated. Another reason is that great efforts had to be put forth initially to build up stocks of essential munitions. After this first accumulation was assured, the maintenance of it becomes a relatively smaller task. The turning point appeared in November, 1942, in which month, after a steady gain, averaging since the end of 1941 nearly $400 million a month over the month immediately preceding, the war expenditures were less than November in both December and January.

Effect of Operating Conditions

In 1942 electric energy output in kilowatthours was 12.2 per cent greater than the previous year, while the maximum demand for power was but 5.1 per cent higher. The latter quantity is the one which measures the ability of the utility industry to carry the load. The difference between the two rates of growth is due to longer hours of operation, thus producing a higher load factor. The load factor of the nation in 1942 set an all time high of 58.4 per cent, the highest previous figure having been 54.5 in both 1929 and 1941. This favorable result arose out of the greater use of the facilities by industry under the pressure of war. The result was, however, largely out of the hands of the utilities themselves, since they had to carry the load at all times, having no control of the operations of individual plants.

The Railroads

The steam railroads in this connection have done an even more outstanding job. With an increase over 1941 of only 1.3 per cent in the average number of freight cars loaded per week, they carried in 1942 33 per cent more ton miles of freight than the year before. This remarkable showing was made through their own efforts: by insisting on and obtaining much higher loading per car and by speeding up freight train movement through better operation and more powerful motive power.

Looking Into the Future

While the purpose of my paper has been to discuss the economics of power supply on the basis of known facts and figures, it may not be amiss to try to apply them to the future so far as we can now visualize it. First, as to the year immediately ahead: We know that the rate of expansion of the expenditure for war is dropping—the monthly increase is about a quarter in the last two months what it was in the first 10 months after Pearl Harbor. We know also that the displacement of civilian by war activity continues apace. It seems doubtful, therefore, that the growth in industrial activity in 1943 will be as great as it was in 1942. The general prevalence of this feeling is reflected in this year's construction budgets of industry, which show on the average one-half the size they did at the same time in 1942. It would be surprising, therefore (assuming the war continues through this year), if electric output or peak grew as much in 1943 as they did in 1942. Discontinuance of War Time and abandonment of the dimout, if generally adopted, could conceivably cause greater growth in peak load in 1943 than occurred in 1942; but on the other hand the new generating capacity scheduled for completion in 1943 is nearly twice as large as the growth in peak load recorded last year.

As to postwar conditions, I have no prophecy whatever to make as to how long the war will last, but we have some indications of the magnitude of the problems of readjustment after the war when we reflect that even now 17,500,000 persons are employed in war work and 7,000,000 are in the armed forces, and when we consider further that 65 per cent of the total national income is now being applied to war work. This rate of war expenditure took two years to build up; it will probably shrink more rapidly than it grew, even if, due to its size and world-wide scope, the dissolution of war activity should be a more gradual process after this war than it was after World War I. In any event, it will take a quick pick-up indeed in the resumption of civilian activity to prevent an initial slowdown in business ac-

(*Continued on page 92*)

War and Customer Service

By P. S. Arkwright
President, Georgia Power Company

EDITOR'S NOTE—This short talk, which contains much that is of more than local interest, was addressed to employees of the Georgia Power Company and transcribed for use at a series of divisional meetings held during January to introduce the new Customer Service Program of the company. The new program is outlined in an article by John H. Stevens on page 90.

ALMOST 800 of our fellow-employees have already answered the call of America at war. They are serving at battle stations the world around—from Bermuda to Iceland, from Brazil to Dakar, from Casablanca to Cairo, in New Guinea and New Caledonia, in India and the Solomon Islands, in England, Ireland and Australia—in the Army, the Navy, the Marine Corps, the Coast Guard.

They risk their lives for the country's liberty and freedom. We can hardly compare what we have to do with what they have to do, with the sacrifices they have to make, with the risks they run of shedding their blood for the nation's protection.

These men are members of our own family. They are still with us—they are merely on leave. I hope they will all come back to us, to resume the work they left off to join the fight.

Modern mechanized war takes the active work of everyone in the country to supply the materials needed by the men who meet the enemy. We must do without many things before victory is finally won.

Our business happens to be a critical and essential one. We must keep the war industries going. We must supply civilian needs. The war is taking many of our employees, but we will not do less than the best we can.

The responsibilities of those of us who stay at home, those of us who keep the company operating, are multiplied many times over during times like these. To our men who have gone to fight, we owe the job of holding this company together for them until their return.

In addition, and in order that war goods may be produced and essential civilian services maintained, our responsibility to the individual consumer increases immeasurably.

Materials and repair parts of all kinds are harder to get. Restrictions on the use of gasoline and rubber are tougher. Trained men and women for job replacements are scarce . . . and will become scarcer. But, in spite of all these difficulties, we must maintain adequate service.

I have referred frequently to the "commercial spirit" of the Georgia Power Company. I repeat now—and with greater emphasis—that I think when any business enterprise loses its commercial spirit, it is going down hill. I don't care how big the company gets to be, I don't care how well it establishes itself in the public confidence, I don't care how good the product is, I don't care how low the price is, I don't care how well we treat our customers, no goods and no service are going to sell themselves. And I might add that I don't care how tough the going gets to be in operating the company during a war, we can't afford to sit back complacently while the war is going on and do nothing about keeping the company "sold" to its customers.

I think we should consider thinking of our "commercial spirit" in terms of "customer spirit," during war time—a spirit through which we recognize that our customers, when all is said and done, are the only real asset we have.

The gross income of the company has increased considerably in the past two years. But, as you know, taxes and operating costs have increased correspondingly. We have few, if any, appliances to sell. We have no opportunity to extend rural lines or otherwise to expand the service except for war purposes. By reason of these facts, we need to maintain more favorable contacts with our customers in every classification.

In this period when many sales activities have stopped and ordinary expansion has been suspended, what better job could we do than to engage in a more determined effort to satisfy our customers?

If we try, we can find new ways of being useful to them. If we search, we can discover what actions of ours in the past may have displeased them. If we want to do it and make the effort, we can remove the frictions and add to the satisfactions. And what better time is there for an effort like that than during a war, when all of us need the help that the other man can give and all of us have the duty to help in whatever way we can?

The stress of war does things to the emotions of people. While some individuals may "crack up" and become "war casualties," most people are kinder, more considerate, more appreciative, in spite of the strain. And thus they respond more readily to kindness, considerateness, appreciation, and all the other attributes of friendliness.

During the months of war ahead of us, we will have more occasions than ever in the past to win friends for ourselves and for the company. To do so we must have a spirit of helpfulness. It must be a patronizing attitude, but a sincere, genuine, straight-from-the-heart spirit of helpfulness to our customers.

The company is inaugurating an activity which will be known as the Customer Service Program. It has been my privilege to review the plans for operation of the program, and I want to say that I endorse every phase of it. It constitutes an effective, tangible medium through which to translate our "commercial spirit" into a vigorous "customer spirit."

The new Customer Service Program is not the exclusive responsibility of any one company department. It is a program designed to render valuable wartime assistance to all of our residential, commercial and industrial customers. It will require the wholehearted support of every employee in every department if it is to be successful. Surely, none of us believes that the company's reputation and good will can be wrapped in a neat package and stored away in the basement for the duration. And I am confident that every employee will be glad to share in the opportunities for building and holding customer good will presented by the Customer Service Program.

If we make ourselves truly useful to the public, I am not worried that the public will desert us. The best safeguard against having our business taken away from us is to make the public so well pleased with our service that they will not want anybody else to serve them—not us. The company has made big progress in winning public approval in recent years, and whether we continue to progress lies within our own power.

How Should We Advertise in 1943?

By Kenneth L. Ede

Advertising Manager, Ohio Public Service Company

THREE major studies have been made recently by companies who for years have been studying the thinking habits of American buyers. These three companies are the Psychological Corporation, Daniel Starch, Inc., and Lord & Thomas. Here are some of the findings of these mental-attitude studies.

One of the most significant points that the Psychological Corporation found—at least from my point of view—is the conviction voiced by 87 per cent of the persons interviewed that advertising has a useful function to perform throughout the war. Only 8 per cent turned thumbs down on advertising for the duration.

I might interject here that high government officials seem to be in accord with that same feeling. President Roosevelt, for example, said, in part, in a letter to the president of the Advertising Federation of America this past summer, "for the duration there will be a diminution of product advertising, but this does not mean an end to advertising. There are many messages which should be given to the public through the use of advertising space."

John H. Morse, Chief, Commercial and Economic Information of the Department of Commerce, stated another government attitude toward advertising, and stated it rather well, I believe, when he said, "There is another job for advertising to do during the duration, while the shelves or the showrooms are empty of your goods. We hear talk of deferred demand that is going to leap out of the brush as soon as the cannons cease. Our trouble with deferred demand, as far as we have been able to measure it, seems to be that when it is deferred too long it dies. People's habits change. They forget how much they desired things. They become rooted in different ways of life. Advertising can keep the spark of life in that deferred demand—kept it flickering gently until that day when the United States returns to—not normal demand, but to our actual 'stimulated' demand—for we did not build our standards of living on the normal demands of human beings. No people here has ever operated in a normal market. We have had stimulated demand economy throughout our lifetime—Advertising has been the great stimulator, and now is no time, in our estimation, to shut off the spark that energizes America."

It would seem that if both the great majority of the public and the government are in favor of our continuing advertising we are on pretty safe ground—provided of course, that we advertise with due regard for their desires. So let's get back for another moment to the three surveys.

Again in the survey made by the Psychological Corporation "conservation copy" found almost universal acceptance. As applied to electrical appliances, for example, 96 per cent of those interviewed picked this theme as tops. Some 78 per cent expressed interest in peacetime appliances still available. Sixty-five per cent were interested in copy dealing with manufacturer's preparations for the post-war period. About 56 per cent wanted information about war products being turned out by electrical manufacturers.

I don't think it is difficult to understand why an overwhelming majority want conservation copy. It gets right back to what I said a moment ago. People are interested in themselves and in what the products they buy will do for them. They are not interested in products as such. It is only natural that since their interest is in what the product will do for them—and they can't buy new products when the old wear out—they want to know how they can keep their present products running so they will continue to do a good job for them.

These findings of the researchers should give us one clue as to the theme of at least part of our advertising. It should be conservation of our present appliances.

Of course, we have been doing some advertising along this line, but we'll probably have to do more of it. And because of the exceptional difficulties we are facing in getting repair parts for many appliances it is certain that some of this advertising is going to have to be a plea to the public for patience when they ask us to repair their appliances. More than that much of it is going to have to be informative and instructive in an attempt to get the householder to do as much of the repair work as possible without calling on us.

That people will read and respond to this type of advertising is proved in part by the fact that the Lord & Thomas survey showed that copy telling why products are not available ranked high in reader interest, in fact came near the top of the list as far as male readers are concerned. Since the inability to get products is closely tied in with the necessity for keeping appliances in good condition, it stands to reason that copy featuring these themes will be read.

This is further indicated by the fact that the Lord & Thomas survey showed that among women the above-the-average copy themes were service-economy; service-housekeeping and personal care; service-health; and how manufacturers are helping in the war effort. Note that recurring use of the word "service." It indicated again that people will read advertising that has a service angle. If we can show how we are helping the war effort by being of service, how we can help women to plan more healthful, more economical meals through Health For Victory Clubs and other home economics groups, how we can be of service in aiding them to keep their household equipment in order, and similar service ads, they will read our copy.

It is also interesting to note that the Lord & Thomas survey showed that while advertising making competitive claims constituted a large part of total advertising being run, the public has definitely lost interest in it. According to their survey competitive copy ranked lowest in its appeal for men and among the lowest as far as women readers are concerned.

Another interesting part of the survey of the Psychological Corporation showed that advertising copy that reports achievements chalked up on the production line found a very interested audience, but people interviewed made no bones about their resentment of copy that is boastful. Advertising built around Army-Navy "E" awards registered quite favorably, but 70 per cent

of those interviewed preferred a layout that dramatized the recognition in terms of the men and women who turned out the work, while only 27 per cent voted in favor of an advertisement that simply announced the company's receipt of the award. Here again we see that advertising must have human interest of some sort.

These results of the surveys made among the public give us some guide as to how we should advertise. They indicate rather closely that advertising that has to do with our service, our part in the war effort, our nutrition classes and similar activities will be read by the public because the public is definitely interested in what we have to say about these things.

Bearing some of these thoughts in mind, let's make a brief list of some of the things we want to feature in our advertising. I'll put them in three general groups.

I. The first group would include advertising having to do with merchandise. Under it we would list:

A *Advertising to keep existing equipment in operation.* Under this might come advertisments that feature recipes, menus, and so forth, that is, advertising that encourages people to continue to use those appliances they have been in the habit of using fairly frequently. Under this same heading would come advertisements that specifically give instructions on keeping appliances in good operating order. We can probably include, too, advertisements on the availability of electric power.

B *Advertising to find new owners for appliances not now being used.* These would include advertisements aimed at getting little-used appliances down off the shelves and into operation. It would also include advertisements along the lines of the barter or exchange advertisements we prepared the latter part of last year.

C *Advertising that tells people why they can't buy certain appliances or under what conditions they can buy certain appliances.* We have prepared some ads along these lines this past year. They give us a real opportunity to tie into the war theme.

D And, of course, such *straight merchandise ads* as available appliances make desirable, bearing in mind, however, that such advertising need be neither large, competitive, nor verbose.

II. A second group of advertising themes might fall under the general heading of "Win the War." And I might say here that some of these themes might fall under more than one of these general headings, but since we're interested in making a list, it doesn't matter too much where we put them. At any rate, under this heading we might list:

A *Advertisments to assist the government in its war programs.* This most certainly would include advertisements on the subject of nutrition. It would include any advertisements on tire conservation or the other conservation themes. It would include advertisements telling customers how to change fuses and do minor repair jobs since the theme of such advertising would probably be conservation of transportation equipment. It would probably also include power conservation advertisements should we find it necessary to run any. But more about that later.

B Under the "Win the War" heading I am also going to include *advertisements to help stimulate employee* morale, although you might put them under public relations. But I believe that one big job our advertising can help to do is to sell our own employees as well as our public on the importance of electric power companies, our own in particular, in the war effort. I'm sure utility executives are thoroughly sold on the importance of the electric utility to the war effort, but I feel just as certain that we probably have some employees who aren't as thoroughly sold. The mere fact that we've had employees leave our employ to enter a defense factory in order, as they felt, to improve their draft deferment status, indicates that they were not thoroughly sold on our position in the war program. And I think there are other indications that we need to do a selling job on some of our own employees. Of course, advertisements that fall under this category wouldn't be addressed directly to the employee, but they would feature the employee and the job he is doing to keep the war industries operating 24 hours a day.

C Another theme that I would like to include here is *advertisements that tell the public how we are helping other war plants to produce for Victory.* We have had quite a number of manufacturing plants in our communities win the Army-Navy "E" awards. Not a single one of them could have won the award without our help. Yet we know that not one person in a thousand would voluntarily give us any credit. I see no reason why we can't call attention to the vital part electricity has played [in] winning those Army-Navy "E" awa[rds]. Along this line I feel sure that our [in]dustrial power engineers must have g[iven] ideas to some of our war plants [that] have resulted in increased product[ion]. I see no reason why we shouldn't [tell] the public know of such instances. E[.g.,] the re-lighting of a war plant, a [job] that possibly increases production, re[-]duces accidents, eliminates fatigue [for] workers, and so forth, could be told [in] a way that would bring credit to [the] company and the individuals in our c[om]pany responsible for the job. We m[ight] have many such stories we could t[ell]. And I am sure that many of them co[uld] be told without giving away any [real] secrets.

III. The third group would incl[ude] the various types of public relations a[d]vertising we should be doing. T[hey] would include:

A *Advertising that will help maint[ain] good dealer relations.* We've spen[t a] lot of time and money winning [the] friendship of our dealers. Certainly [we] want to do everything we can to help [the] dealer and to hold his friendship dur[ing] the trying days ahead so that when [the] war is over and the dealer comes b[ack] into his own he'll continue to be [a] friend.

B Then there is the public relati[ons] *advertising that serves to tell the c[us]tomer why we can and cannot do cer[tain] things.* As has recently been pointed [out] some of us have been encouraging [our] customers to keep their appliances [in] order by bringing them into us for [re]pair, yet we, in turn, can't get re[al] parts to fix them. I agree that adv[er]tising telling such facts to the custo[mer] is necessary.

C Then there should be some *adv[er]tising* similar of theme, but specific[ally] *pointing out that appliance repairm[en]* because of their fine training, *have b[een] particularly* wanted for the Army [and] therefore, there has been a shortage [of] skilled repairmen just when demands [for] such service are at their peak.

D Then there's *advertising that l[ooks] to the future.* I'm sure all of you h[ave] seen a lot of advertising featuring [the] theme to buy bonds now and earn [for] them for certain appliances later. I [also] think Hotpoint started that theme [and] it is not only very successful with th[em] judging from the response they got to [it] but they have been followed by m[any] other manufacturers with the s[ame] theme. Many of these have been in

ctrical appliance field and there have o been many in the home equipment d furnishing field. We can tie into ch a theme very easily. A U. S. Cham- of Commerce survey is authority for se figures: I quote, "When the war ps there will be an immediate demand 2,100,000 autos, for 1,500,000 me- anical refrigerators, for 1,200,000 ra- o sets, for 1,200,000 electric washing achines, for 900,000 electric irons, and 0,000 sewing machines. You'll note at on this short list four out of the items are electrical appliances and en sewing machines might be classi- d as an electric appliance. The survey es on to say that homes will be built bought by 900,000 families; that re than 1,200,000 families will be ospects for furniture, household ap- iances, and floor coverings. Better an 3 out of 10 home owners will make pairs to their homes within 6 months fter the war. And so on. There is oing to be a tremendous market. But e sales organizations that make the ost of that market will be the ones ho have pre-sold the market in some y. The "Buy-Bonds-Now-for-Prod- s-Later" theme does a two-fold job ong this line. It helps the government ll war bonds and hence is patriotic, d it helps earmark purchases for after e war.

E Finally, there's the kind of public lations advertising that offsets the fact, Ash Collins puts it, that we're now ying "No" to a helluva lot of people. Ash points out, a large number of ur person-to-person contacts today con- st of saying "no" to our customers. No we can't sell you a refrigerator," No we can't get material to build that ine extension," "No we can't get a re- ir part for your range or other ap- iance." In addition to that Ash also authority for the statement that the ctrical industry today is losing the ajor portion of some 375 million per- n-to-person contacts, contacts formerly ade by the sales people of the various ectrical outlets. You all know that we re losing thousands of such contacts in r own operations. We are reading eters fewer times. We have fewer stomer service representatives and they re making fewer contacts. We are aking fewer service calls, fewer ap- iance repair calls, probably fewer home monstrations. Only in our home ghting department, probably, are we ntinuing our average of person-to-per- n calls of recent years. When you couple this fact together with Ash Collins' point that of the contacts left to us many are "No" contacts, you can certainly appreciate that we must make up for our lost person-to-person contacts as much as possible with advertising contacts—and advertising contacts that are as personal as we can make them and that make as many friends as possible.

The above listing is probably by no means complete. There are other themes that we might include. Conditions that we cannot now forsee will undoubtedly suggest others as 1943 rolls along.

Then there is one more general subject that I would like to touch on before closing, because it is something that will have an effect both directly and indirectly on our advertising of the future.

That is the subject of the various government restrictions, and government and other trends.

First, we had the restriction as to the appliances that we ourselves have been selling. I needn't go into that because you all know the situation as regards our merchandise stocks. Since available merchandise is so limited it seems hardly good economics to run any volume of sales advertising to move them.

The second restriction which affect us are restrictions as to transportation since they will affect our service. This will make necessary certain advertising to keep the public informed that we simply can't drive ten miles to replace a fuse, or to do other equally unnecessary things that the householder can do himself. I have touched on this above.

The third restriction is the one I believe offers us the greatest opportunity. We've heard considerable in the past few days about new food rationing regulations to come. We've heard a lot about food shortages. These two things plus the growing scarcity of doctors are going to present us a real opportunity for service. The study of nutrition and its relation to health is pretty much beyond the average woman in that she can't be bothered figuring out her meals on the basis of the proper amounts of vitamins and minerals. But add to that now the fact that she won't be able to get some things at all and some things will be rationed so that she will have to use lesser amounts, and probably at odd times, and you complicate her problem no end. Anyone who can help her to plan her meals with available foods, or tell her how to use the substitutes she will have to use, will render her a service that, if it is rendered the right way, will make her a friend for life. There is a world of opportunity for us in food rationing. It would seem to me that here is one of the primary themes for our 1943 advertising.

It is perfectly possible that there will be other government restrictions that will affect our situation and call for advertising. One of these might be a restriction on the use of power for homes and offices. We are hopeful that that situation will not exist. Certainly as long as it does not exist and there is no strong indication that it will, we should, from time to time, let our customers know there is no power shortage as yet.

In addition to these definite restrictives there are a number of trends, or straws in the wind that might be well worth considering in studying what and how we should advertise.

First are the government's steps toward concentration of industry. About a month ago Joseph L. Weiner, director of the WPB's Office of Civilian Supply, said this: "Concentration of production when it will increase our war potential has been adopted as a policy by the War Production Board. We keep no list of industries nor do we know how many plants will be affected by concentration. Civilian production may be curtailed so severely by the war program that we must attempt to insure continued production of essential civilian supplies by concentrating the limited amount of business in a few plants. Businessmen must face a temporary cessation of business unless they can participate in the war program."

You may ask what this has to do with our advertising program. It might help if I quote from a recent editorial on the subject. "A sharp set-up (in concentration of industry) is indicated. The enthusiastic advocates of concentration as a means of conserving manpower are continually trying to prove their point by British experience. This sounds convincing enough until people begin to think a bit. If British businesses are concentrated to the extreme certain officials here think necessary for the United States, why is it that the American public can still buy Burberry and Aquascutum overcoats so long advertised in England and here? Why is it that American stores offer Dunhill pipes, British trade-marked and advertised shoes such as Peels, and numerous other British-made items? There is a real war going on and Britain is doing its full part—but why is it that South

American wheat buyers can buy British trade-marked and advertised farm machinery? Here we have the curious situation of certain theorists in the United States government trying to proceed in a way which will cause individual trade marks to lose their value. Those trade marks accumulatively form a great national asset both for export trade now and for post-war reconstruction. There is something strange about our whole approach to this problem and our failure to realize that at its very best, concentration will save very little manpower. If hours were lengthened and manpower allocated more efficiently, there would be little need—much less excuse—for even considering concentration."

We in our own industry have seen what might be termed a government drive at concentration of the electric power industry through such mediums as the TVA and other government power authorities. While these moves toward concentration of other industries are being cloaked with war-time necessity it is just barely possible that they do indicate that the drive to kill off private business is still doing business at the same old stand. While the concentration of production in the plants of a very few manufacturers may not in itself have an effect on us, the tendency that it implies most certainly may, and it behooves us to make every effort possible to win as many friends as we can as quickly as we can.

Another trend that is becoming more noticeable as time goes on is the swing toward new and different methods of distributing merchandise. One indication of this is the fact that after some dickering back and forth as to what they could say and couldn't say the Cooperative League of the U. S. A. has signed for a nationwide radio service to be broadcast over some 30 major key stations beginning about the first of February. This organization is a national educational federation of consumer cooperatives, coordinating the activities of some 20 regional and national cooperatives with a combined membership of some 1,115,000 members. As I understand it the organization helps the member co-ops in establishing stores, getting members, etc. A national radio program, while restricted in the appeal it can make, will help focus attention on this method of the distribution of merchandise.

Another movement that is being presented as a complement to mass production is mass consumption. How far such a movement will get is, of course, problematical, but in effect it calls for the practical elimination of the wholesaler, retailer, and other intermediaries of distribution. If carried to its extreme it would eliminate all or practically all salesmen.

This mass consumption movement may be another of those economic theories that never see the light of day. But such movements do indicate that there are a lot of people who at least think they aren't satisfied with our present methods of distribution. Since most people probably have nothing very definite against our present system, they probably have nothing in their attitude that can't be cured by good public relations. Advertising that helps to build our company as a friendly, necessary, desirable part of our communities will offset a great many of the arguments used to foster such movements as co-operatives and mass consumption. Advertising which simply sells merchandise at a price will not, since lowered prices are the keynote of most such movements.

What has all this got to do with our advertising? Simply this, if we don't tell our story, if we don't win friends now, if we let someone else tell our story for us we are simply assisting the proponents of some of these private and governmental schemes to put their stories over. Right now we're getting set to learn to buy foods by a point system. Government grade labeling of many products is not too far off. That is, instead of asking for certain products by brand name we'll be asking for them by Grade "A," Grade "B," and so forth. We'll get used to buying "Victory" models and "Utility" models, not "Frigidaires" or "Westinghouses." What better and more fertile soil for breeding and propagating these new schemes of distribution—all of them leading to centralization, elimination of the individual initiative economy which we now enjoy, or perhaps I should say did enjoy up to recent months?

On beyond the fact that we still want to be in the merchandise business a year or five years hence, we also want to be in the private utility business. But unless we take advantage of every opportunity—to use the words of a successful writer—to win friends and influence people—we will have ourselves at least partially to blame if we aren't in the merchandise business or private uti business five years hence.

One thing I believe we are often to forget is that we in the private uti business who live it every day, breathe it and eat it, are so close t that we allow ourselves to believe our customers are just as aware of it we are. But you know as well as I when you think of it, that such is the case. As an individual electric ity the public doesn't care a hoot a us. All they want is the opportunity push a button on the wall and have room plunged into brilliant light They should worry who makes that acle possible.

I think one of the best lessons in p lic reactions can be learned right f something that happened within our industry. You know all about it, I'll remind you of it.

When TVA ran short of power war production in the southeast in summer of 1941 and had to draw privately managed electric companies help, conditions were such that th was an inevitable temporary power sh age in that area because of the drou What happened? You know. E newspaper was filled with stories a power shortages. And did only the f in the southeast turn off their lights, down on their use of electricity? at all. People in California, Minne yes and in Ohio, began curtailing. when the TVA's power shortage over, what happened? Did people mediately start turning the power on. They did not. Many people in southeast areas particularly, and m others in other areas had in that time learned a habit so well th never gotten over it. The result is the consumption of electricity for dential and commercial purposes, ticularly in the southeast, has never back up to the former high levels.

On top of this came Pearl Ha which was the beginning of one sh age after another—aluminum, co iron and steel, wood, gasoline, ru sugar, coffee, and other products, a with the now constant drumming o shortage of fuel for house heating.

Someone once said that man's gre habit is to form a habit. Once you people in the habit of snapping off lights, or of encouraging the childre see that lights are turned off and o ing to split the savings with them, conserving on the use of applian

(*Continued on page* 74)

Domestic Electric Service in 1942

WHILE the use of residential (or domestic) electricity reached new high levels in 1942, the calculation of the annual table of energy used by the various kinds of appliances presents unusual difficulties, which are explained later in this article.

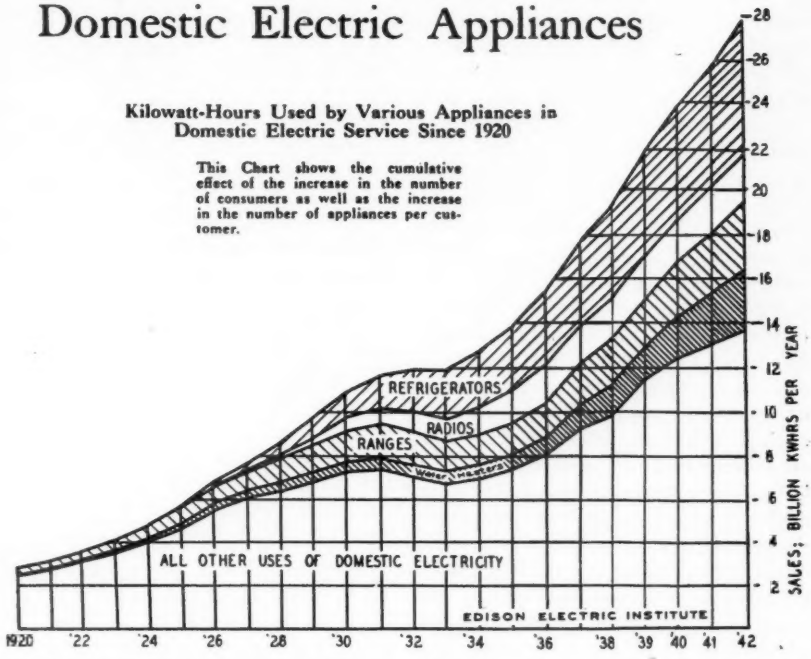
The number of customers of domestic electric service grew by about 700,000 during 1942, and the annual electrical use of the average customer is estimated at 1024 kwhr. This represents an increase of 38 kwhr, or 4 per cent, over the figures for 1941. The total electric consumption rose from 25,785,000,000 kwhr for residential (and for domestic service part of "rural") sales in 1941 to about 27,800,000,000 kwhr in 1942; a gain of 2,015,000,000 kwhr or 7.8 per cent. In spite of cessation of sales promotional activities and in the face of other war-engendered obstacles, customer demands for electric energy enabled the electric light and power industry to register the second largest increase in residential service in its history. This record was exceeded only by the increase in 1940 sales over those of 1939.

The 1942 increase was primarily due to the enormous volume of appliances sold in 1941, when $1,625,000,000 worth were distributed to consumers, the full results of which were not apparent until 1942. In 1942, however, electrical appliance sales receded to depression levels with an estimated total of $500,000,000 leaving the outlook for domestic electricity sales in 1943 less favorable than it was a year earlier. The situation will be particularly aggravated by the breaking up of homes which will follow the passage of the Selective Manpower Act.

Domestic Electric Appliances

Kilowatt-Hours Used by Various Appliances in Domestic Electric Service Since 1920

This Chart shows the cumulative effect of the increase in the number of consumers as well as the increase in the number of appliances per customer.


REFRIGERATORS
RADIOS
RANGES
Water Heaters
ALL OTHER USES OF DOMESTIC ELECTRICITY
EDISON ELECTRIC INSTITUTE
1920 '22 '24 '26 '28 '30 '32 '34 '36 '38 '39 '40 '41 '42
2 4 6 8 10 12 14 16 18 20 22 24 26 28
SALES; BILLION KWHRS PER YEAR

ENERGY USED BY DOMESTIC ELECTRIC APPLIANCES (AN ESTIMATE FOR THE YEAR 1942)

Appliance	Number in Homes On Dec. 31, 1941	Number in Homes On Dec. 31 1942	Saturation %	Average Number in Homes 1942	Kwhr per Year per Appliance, in Normal Use	Per cent in Normal Use	Effective Kwhr per Year per Appliance	Total Kwhr Used in 1942
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lighting & all other appliances not listed below (per Customer, 346 kilowatthours)								9,385,000,000*
Refrigerators	19,250,000	19,500,000	71%	19,375,000	347	90	312	6,045,000,000
Ranges	3,184,000	3,350,000	12%	3,267,000	1,080	90	975	3,185,000,000
Water Heaters (all types)	980,000	1,050,000	4%	1,015,000	3,500	75	2,625	2,665,000,000
Radios & Phonographs**	26,800,000	27,500,000	100%	27,150,000	100	80	80	2,175,000,000
Flatirons**	26,800,000	27,500,000	100%	27,150,000	100	80	64	1,735,000,000
Oil Burners	2,250,000	2,325,000	8½%	2,287,500	250	75	187½	430,000,000
Toasters	1,470,000	1,575,000	6%	1,522,500	300	75	225	345,000,000
Vacuum Cleaners	16,150,000	16,400,000	60%	16,275,000	24	85	20	325,000,000
Washing Machines	13,350,000	13,350,000	49%	13,350,000	30	80	24	320,000,000
Space Heaters	5,700,000	5,700,000	21%	5,700,000	75	60	45	255,000,000
Percolators, glass	4,475,000	5,200,000	19%	4,837,500	70	75	52½	250,000,000
Electric Clocks	14,700,000	15,000,000	55%	14,850,000	15	95	14	210,000,000
Heaters	13,950,000	13,650,000	50%	13,800,000	30	50	15	205,000,000
Ironing Machines	1,775,000	1,800,000	6½%	1,787,500	125	80	100	180,000,000
Percolators, metal	4,600,000	4,450,000	16%	4,525,000	40	50	20	90,000,000
Total Appliances								18,415,000,000
Total Domestic Service	(Per Customer 1,024 Kwhr)							27,800,000,000*
Number of Customers	26,800,000	27,500,000		27,150,000				

Notes: Columns (1) and (2): Estimates largely from ratios shown in "Electrical Merchandising" and other trade papers, being based upon the summation of annual sales of appliances less an estimated replacement demand. Column (4): The arithmetical average of columns (1) and (2). Column (6): An estimate allowing for duplicate and unused appliances, houses unoccupied; summer cottages, vacation periods, etc. Column (7): The product of Columns (5) and (6), representing the actual kwhr per year per average appliance in the home. Column (8): The product of Column (4) and Column (7).

* Preliminary figures.

** Many homes have duplicate sets of radios and flatirons, whose grand total is not possible of determination. From general indications, however, it appears that these duplicate sets do not greatly change the total amount of electricity used. In this table, therefore, the assumption is made that the saturation of these appliances is complete and the energy use is calculated upon the total number of homes.

During the year, the usual formulas for the mortality of the various appliances and the customary assumptions as to the average annual use of energy by each type were upset by several new factors. After the first three or four months, the manufacture of new appliances practically came to a halt and sales were confined to dealers' stocks and reconditioned units. On the other hand the energetic campaigns for improved maintenance and the better care of appliances served to reduce the annual mortality to a considerable extent. Further complications arose from the consequences of coffee rationing and from the shortage of fuel oil along the Atlantic Seaboard. While the existence of all of these factors is common knowledge, the quantitative determination of the value of each of these variables is impossible. It is with some diffidence, therefore, that the following assumptions are advanced as what might be termed an educated guess as to the present state of affairs.

(a) *Mortality.* This has been arbitrarily assumed to be half that of the previous year.

(b) *Electric Ranges.* The 1940 Census of the United States showed the following uses of fuel for cooking as of April, 1940. This somewhat upset preconceived ideas because the census showed only 1,838,296 electric ranges in contrast with the estimate of *Electrical Merchandising* of 2,510,000 on Jan. 1, 1940, and the EEI total of 2,300,000 as of April 1, 1940.

Type of Fuel	*Number of Families*	*% of Total*
Gas	16,777,295	48.8
Wood	8,103,000	23.6
Coal or Coke	3,963,118	11.5
Kerosene or Gasoline	3,344,680	9.7
Electricity	1,838,296	5.4
All Other	320,385	0.9
Total	34,347,124	100.0

The Census questions were worded so as to show the *chief,* or predominant, type of fuel; so the great disparity between the number of ranges claimed by the trade and the number actually reported by the Census is explained by the fact that there were many electric ranges that were in use only seasonally, or part time.

For this reason, the former estimate of the energy used by the *average* electric range of 1200 kwhr per year has been reduced by the following method:

EEI estimate of ranges, April 1, 1940		2,300,000
Ranges reported by U. S. Census		1,838,296
Ranges, part time		461,704
1,838,296 ranges @ 1200 kwhr	2,205,000,000 kwhr	
461,704 ranges @ one half of 1200	277,000,000 kwhr	
2,300,000 ranges @ 1080 kwhr	2,482,000,000 kwhr	

(c) *Fuel and blackouts.* The use of electricity by oil burners has been reduced because of the effect of the fuel shortage along the Atlantic Seaboard during the last two months of the ye It must be pointed out, however, that far as 1942 is concerned, this affec only half the number of customers only a third of the heating season. offset to this has been the really extra dinary increase in the use of porta or space heaters. Due to coffee rati ing, which has materially reduced amount of coffee brewed, the kwhr percolators have also been scaled do

Home lighting was affected by bla outs and by dimout regulations al tidewater but decreased energy use fr this source was more than offset by gr er utilization of room coolers, fans, s lamps, waffle irons, mixers and a s of other appliances in the miscellane classification. There are indications t many of these appliances, formerly u only intermittently, are beginning come off the closet shelves into more quent use.

The final results appear in the acc panying table and the historical deve ment of the use of electricity by m appliances is shown on the chart.

W. M. Carpenter.

How Should We Advertise in 1943?

(*Continued from page* 72)

once you sit idly by and let hotels put cards in every room asking guests to turn off lights because there is a shortage of electricity, cards that are read by thousands of people a week who go back home and turn off lights there, too—once we let people get into the habit of these things—and it is certainly a matter of habit rather than a matter of common sense or actual facts, at least now—we can make up our minds to one of two things, either we're going to lose a lot of our good pay load permanently, or we're going to have to spend a whale of a lot of money and salesmanship to win it back again later on.

And now just one more thought along the line of co-operatives, mass consumption, and other trends, I want to remind you of the editorial that ran in the *Saturday Evening Post* some months ago and was re-printed rather widely throughout the country. Here is one paragraph from it: "We do know this much—that the general idea of the collective state has made tremendous strides in America. In July, 1942, one of the leading public opinion polls asked the people whether some form of socialism would be good or bad for the United States. Only 41 per cent of the people thought it would be bad. Twenty-five per cent thought that it would be good, and 34 per cent had no opinion. In other words, 38 per cent of all who had an opinion favored collectivism. Ten years ago this would have been incredible. It is not incredible now."

Perhaps remarks of this kind do not properly belong in a paper on advertising. But I believe they do, for unless we give some recognition to these trends and take some steps to offset th through an informative advertising p gram which features the part that p vate industry and particularly our electric utility is playing in the war p gram and in the daily lives of the pub it might be just possible that the t will come when we won't have the portunity to do any advertising, or any selling. Therefore, even if for other reason than that we have no m chandise to sell, yet we feel we must some advertising, let's devote part of space at least to that kind of advertis which will help us as individuals, a company, and as a nation to continue live a free life in a free democracy under a free social economy that will able each of us here to develop our dividual lives to the best of our in vidual efforts and capabilities.

A Test Case Showing Computation of Depreciation Under the Group Plan by the Asymptotic Method

By Harold G. Avery

Associate Professor of Business Administration and Economics, Bradley Polytechnic Institute, Peoria, Ill.

PUBLIC utilities must approach the depreciation problem from the standpoint of governmental interpretation and authoritative regulation in order to satisfy the requirements of the Bureau of Internal Revenue and other state regulatory bodies. The accounting principles and practices applying to depreciation in these cases are mandatory to a certain extent. Tax forms and reports must be filled out according to a certain pattern, together with standardized supporting exhibits and schedule, and the contents of these statements must be approved by the collector of the Bureau of Internal Revenue and other commission heads.

The proper allowance for depreciation is that amount which should be set aside for the taxable year in accordance with a reasonably consistent plan (not necessarily at a uniform rate) whereby the aggregate of the amounts so set aside, plus the salvage value, will, at the end of the useful life of the property in the business, equal the cost or other basis of the property."[1] Theoretically, the taxpayer is allowed to recover, over the useful life of the depreciable property, the difference between its cost or other basis and its salvage value.

Public utilities ordinarily classify their accounts according to a group plan, wherein the assets similar in kind which have approximately the same average lives are included in one account, such as Station Equipment, Towers and Fixtures, Poles and Fixtures, Overhead Conductors and Devices, Underground Conduits, Line Transformers, Services, Mains, and Meters. The property items are classified into homogeneous groups, not just of similar assets, but of similar assets with the same average lives.

Standardized schedules are submitted to the Treasury department in order that verification of depreciation allowances claimed by the utility may be facilitated. Various procedures have been developed by the government in order to test the reasonableness of allowable depreciation for assets under the group plan. The data obtained from the schedules are analyzed usually in ratio form in order that certain tests can be applied. Among the ratios that are used by the Treasury for the purpose of testing allowable depreciation are (1) retirement to investment, (2) unretired costs to additions (survival ratios), (3) reserve balance to plant account balance, and (4) cumulative addition and retirement ratios (to which the asymptotic method is applied). This paper is concerned only with the latter method used by the Treasury to verify the depreciation allowance of public utility accounts under the group plan.

The Asymptotic Method

The theory of the asymptotic method[2] is based on the assumption that the addition and retirement ratios of a group account will approach some constant level. In the case of a stable group account of homogeneous units, the additions or replacements eventually must equal the retirements in units and dollar values (assuming of course a constant price level); whereas in the case of a growing account, the addition ratios have a greater value than the retirement ratios. The proponents of the method contend that the true value of the depreciation rate must lie somewhere between the limits of the addition and retirement ratios, and that the geometric mean of these two ratios yields a closer approximation of the true average rate of depreciation than the arithmetic mean.[3] The formula used for determining the geometric rate is

$$d = \sqrt{a\ a'}$$

wherein a represents the retirement ratio and a' the addition ratio.

Some of the advantages claimed by the adherents of the asymptotic method as compared with other methods for determining the allowable depreciation on group accounts are (1) the data required for the proper application of the method are usually available, (2) the assumptions implicit in the theory are not at variance with experience, (3) the fitting of the addition and retirement ratios by the method of least squares does not contain the faults found in "type" curves nor in the free hand method, and (4) the method makes it possible to construct a "built-up" reserve for depreciation where it is impossible to do so in an actuarial or appraisal study.

Outline of Test Case

Several group accounts of a large public utility company were tested by the asymptotic method at the request of the Bureau of Internal Revenue for the purpose of verifying the rates allowed for income tax purpose. The objective of this paper is to explain the procedure followed in conducting these tests, although only one account will be used for illustrative purposes. Several basic steps have been explained in detail in order that the method can be applied by the public utility accountant.

The study includes a cycle of twenty-one years, extending from 1920 through 1941, since this period represents a fairly constant growth of the company's assets and also includes an era of peace in our national economy. The Poles and Fixtures account is considered typical. At

---

[1] U.S. Bureau of Internal Revenue, *Bulletin "F,"* (revised January, 1942), p. 2.

[2] The writer has used the method devised by Joseph Jeming, described in Scharff, Leerburger, Jeming, *Depreciation of Public Utility Property*, (Collection of Papers), (1941), pp. 97-136. Also article by Joseph Jeming on "An Asymptotic Method of Determining Annual and Accrued Depreciation," *Edison Electric Institute Bulletin*, Vol. I, January, 1940, pp. 27-32.

[3] *Ibid.*, p. 101

TABLE I—DEPRECIABLE PROPERTY ADDITIONS, RETIREMENTS, AVERAGE BALANCES, AND NET RETIREMENT LOSS BY YEARS AND BY ACCOUNTS FOR PERIOD 1920-1941—ELECTRIC PROPERTIES

Account - Poles and Fixtures

Year (1)	Balance at Beginning of the Year (2)	Additions During the Year (3)	Retirements During the Year (4)	Balance at the end of the Year (5)	Average Balance (6)	Net Retirement Loss During the Year (7)
1920	587,375.37	46,762.61	959.20	633,178.78	610,277.08	630.16
1921	633,178.78	51,575.13	4,987.73	679,766.18	656,472.48	3,347.99
1922	679,766.18	90,029.26	7,916.65	761,878.79	720,822.49	6,224.94
1923	761,878.79	91,647.18	15,706.91	837,819.16	799,848.98	13,609.75
1924	837,819.16	207,085.39	15,156.31	1,029,738.24	933,778.70	13,978.56
1925	1,029,738.24	202,479.48	10,645.34	1,221,572.38	1,125,655.31	9,552.97
1926	1,221,572.38	112,706.28	6,058.35	1,328,220.31	1,274,896.35	4,955.98
1927	1,328,220.31	103,725.95	4,856.48	1,427,089.78	1,377,655.05	3,871.63
1928	1,427,089.78	92,923.17	19,550.12	1,500,462.83	1,463,776.31	17,652.62
1929	1,500,462.83	207,128.00	17,519.52	1,690,071.31	1,595,267.07	12,459.64
1930	1,690,071.31	171,128.03	51,994.41	1,809,204.93	1,749,638.12	44,031.67
1931	1,809,204.93	127,149.80	19,722.18	1,916,632.55	1,862,918.74	19,240.26
1932	1,916,632.55	55,614.60	8,542.76	1,963,704.39	1,940,168.47	8,251.36
1933	1,963,704.39	53,209.98	26,013.52	1,990,900.85	1,977,302.62	25,571.41
1934	1,990,900.85	49,011.81	28,145.96	2,011,766.70	2,001,333.78	27,192.69
1935	2,011,766.70	44,163.77	44,617.49	2,011,312.98	2,011,539.84	44,190.30
1936	2,011,312.98	147,366.62	25,123.04	2,133,556.56	2,072,434.77	24,706.95
1937	2,133,556.56	203,281.07	47,736.95	2,289,110.68	2,211,333.62	45,846.03
1938	2,289,110.68	279,874.40	103,390.14	2,465,594.94	2,377,352.81	100,675.27
1939	2,465,594.94	122,267.19	68,706.90	2,519,155.23	2,492,375.09	65,729.65
1940	2,519,155.23	145,774.96	65,842.28	2,599,087.91	2,559,121.57	60,821.97
1941	2,599,087.91	124,334.86	53,866.40	2,669,556.37	2,634,322.14	47,635.46
Totals		2,729,239.54	647,058.54	2,669,556.37		599,157.16

Net Retirement Ratio	92.597%
Salvage Factor	7.403%
Gross Retirements - (Col. 4)	100.000%

the beginning of 1920, the account contained a balance of $587,375.37, and during the twenty-one year period a reasonable constant growth was maintained as evidenced by the figures in Column I of Table I, until the balance of the Poles and Fixtures account at the end of 1941 was $2,669,556.37.

As a guide to the steps in calculating the average depreciation rate by the asymptotic method, the following index will prove helpful:

INDEX—DETERMINATION OF DEPRECIATION BY ASYMPTOTIC METHOD

Poles and Fixtures Account

TABLE I—Depreciable Property Additions, Retirements, Average Balances, and Net Retirement Loss by Years for Period 1920-1941.

TABLE II—Cumulative Depreciable Additions, Retirements and Average Depreciable Property Balance.

TABLE III—Analysis of Additions — Computation of Values for Normal Equations.

TABLE IV—Analysis of Retirements—Computation of Values for Normal Equations.

TABLE V—Analysis of Additions — Solution of Normal Equations.

TABLE VI—Analysis of Retirements — Solution of Normal Equations Gross Depreciation Rate—Geometric Mean.

CHART A—Showing Percent Ratio Additions or Retirements to Average Fixed Capital Balances by Years.

CHART A—Schedule 1. Calculation of Fitted Trend for Additions.

CHART A—Schedule 2. Calculation of Fitted Trend for Retirements.

APPENDIX A—Table of x^{-n} and Sum x^{-n}.

Analysis of Original Data

The information gathered in Table I is taken from the book accounts with the exception of the calculated average balance. The table shows the beginning balance, yearly additions and retirements, the balance at the end of the year, average balance, and the net retirement loss for the year. The average balance is determined by adding the balance at the beginning of the year to the balance at the end of the year, and dividing by two. At the bottom of the table, the net retirement ratio and the salvage factor for the twenty-one year cycle are shown. The net retirement ratio of the Poles and Fixtures account is calculated by dividing the total net retirement loss by the total retirements, or 92.597 per cent.

Table II shows the cumulative amounts in terms of average balance, additions, retirements, addition ratios, and retirement ratios. The ratios are not determined for the first year of the cycle, because the retirements during the first year are negligible and the beginning balance of the account (usually the cost of original equipment) is add in the first year cumulative total of a ditions. The significant columns Table II contain the cumulative ad tion and retirement ratios, which plotted as the actual trend curves Chart A. The next step is to determ the asymptotic curve that will fit e of the trends as measured by the cum lative and retirement ratios.

Method of Least Squares

The cumulative addition and reti ment ratios are fitted by the method least squares. The function A (cumul tive addition ratios) $= a' + b'x^{-1} + c'x^{-2} \ldots$, and the function R (cumul tive retirement ratios) $= a + bx^{-1} + cx^{-2} \ldots$ The normal equations functions A are:

$$n'a' + b'S(x^{-1} + c'S(x^{-2}) \ldots = S(A)$$
$$a'S(x^{-1}) + b'S(x^{-2}) + c'S(x^{-3}) = S(Ax^{-1})$$
$$a'S(x^{-2}) + b'S(x^{-3}) + \ldots = \ldots$$

where n' is the number of the observ ratios or 21, a' is the value of the asym tote of the addition ratios, and x rep sents the years. $S(A)$ is the sum of cumulative ratios for twenty-one ye $S(Ax^{-1})$ is the sum of the cumulat ratios multiplied by the value of x^{-1},

Either tables can be constructed calculating x^{-n} and $S(x^{-n})$ for x numb of years, or they can be found in bo of specialized mathematical tables. writer constructed a table of x^{-n} and S for twenty-one years as found in App dix A. From this table the coefficie of the constants a', b', and c' in left-hand members of the equation be found. The construction of Tab III and IV is necessary in order to f the values of the right-hand member the equation; Table III for the com

TABLE II—CUMULATIVE DEPRECIABLE ADDITIONS, RETIREMENTS AND AVERAGE DEPRECIABLE PROPERTY BALANCE BY ACCOUNTS FOR THE PERIOD 1920 TO 1941 FOR ELECTRIC PROPERTIES

Account - Poles and Fixtures

Year (1)	Cumulative Average Balance (2)	Cumulative Additions (3)	Cumulative Retirements (4)	Cumulative Addition Ratio (5)	Cumulative Retirement Ratio (6)
1920	610,277.08	634,137.98	959.20		
1921	1,266,749.56	685,713.11	5,946.93	.5413	.0047
1922	1,987,572.05	775,742.37	13,863.58	.3903	.0070
1923	2,787,421.03	867,389.55	29,570.39	.3112	.0106
1924	3,721,199.73	1,074,474.94	44,726.70	.2887	.0120
1925	4,946,855.04	1,276,954.42	55,382.04	.2635	.0114
1926	6,121,751.39	1,389,660.70	61,440.39	.2270	.0104
1927	7,499,406.44	1,493,386.65	66,296.87	.1991	.0088
1928	8,963,182.75	1,586,309.92	85,946.99	.1770	.0096
1929	10,558,449.82	1,793,437.92	103,366.51	.1699	.0098
1930	12,308,087.94	1,964,565.85	155,360.92	.1596	.0126
1931	14,171,006.68	2,091,715.65	175,083.10	.1476	.0124
1932	16,111,175.15	2,147,330.25	183,625.86	.1333	.0114
1933	18,088,477.77	2,200,540.23	209,639.38	.1217	.0116
1934	20,089,911.55	2,249,552.04	237,785.34	.1120	.0118
1935	22,101,351.39	2,293,715.81	282,402.83	.1038	.0128
1936	24,173,786.16	2,441,082.43	307,525.87	.1010	.0127
1937	26,385,119.78	2,644,363.50	355,262.82	.1002	.0135
1938	28,762,472.59	2,924,237.90	458,642.96	.1017	.0160
1939	31,254,947.68	3,046,505.09	527,349.86	.0975	.0169
1940	33,813,969.25	3,192,280.05	593,192.14	.0944	.0176
1941	36,448,291.39	3,316,614.91	647,058.54	.0910	.0178

TABLE III—ANALYSIS OF ADDITIONS—POLES AND FIXTURES COMPUTATION OF VALUE FOR NORMAL EQUATIONS

I (1)	A Cumulative Addition Ratio (2)	Ax - 1 (3)	Ax - 2 (4)	Ax - 3 (5)
1	.5413	.5413000	.5413000	.5413000
2	.3903	.1951500	.0975750	.0487875
3	.3112	.1037333	.0345778	.0115260
4	.2887	.0721750	.0180438	.0045109
5	.2635	.0527000	.0105400	.0021080
6	.2270	.0378333	.0063056	.0010509
7	.1991	.0284429	.0040633	.0005805
8	.1770	.0221250	.0027656	.0003457
9	.1599	.0188778	.0020975	.0002331
10	.1536	.0159600	.0015960	.0001596
11	.1478	.0134182	.0012198	.0001109
12	.1333	.0111083	.0009257	.0000771
13	.1217	.0093615	.0007201	.0000554
14	.1120	.0080000	.0005714	.0000408
15	.1039	.0069200	.0004613	.0000308
16	.1010	.0063125	.0003945	.0000247
17	.1002	.0058941	.0003467	.0000204
18	.1017	.0056500	.0003139	.0000174
19	.0975	.0051316	.0002701	.0000142
20	.0944	.0047200	.0002360	.0000118
21	.0910	.0043333	.0002063	.0000098
Sums	3.93180	1.1691469	.7245304	.6110155

TABLE IV—ANALYSIS OF RETIREMENTS—POLES AND FIXTURES COMPUTATION OF VALUES FOR NORMAL EQUATIONS

X (1)	R Cumulative Retirement Ratio (2)	Rx - 1 (3)	Rx - 2 (4)	Rx - 3 (5)
1	.0047	.0047000	.0047000	.0047000
2	.0070	.0035000	.0017500	.0008750
3	.0106	.0035333	.0011778	.0003926
4	.0120	.0030000	.0007500	.0001875
5	.0114	.0022800	.0004560	.0000912
6	.0104	.0017333	.0002889	.0000481
7	.0088	.0012571	.0001796	.0000257
8	.0096	.0012000	.0001500	.0000188
9	.0098	.0010889	.0001210	.0000134
10	.0126	.0012600	.0001260	.0000126
11	.0124	.0011273	.0001025	.0000093
12	.0114	.0009500	.0000792	.0000066
13	.0116	.0008923	.0000686	.0000053
14	.0118	.0008429	.0000602	.0000043
15	.0128	.0008533	.0000569	.0000038
16	.0127	.0007938	.0000496	.0000031
17	.0135	.0007941	.0000467	.0000027
18	.0160	.0008889	.0000494	.0000027
19	.0169	.0008895	.0000468	.0000025
20	.0175	.0008750	.0000438	.0000022
21	.0178	.0008476	.0000404	.0000019
Totals	.2513	.0333073	.0103434	.0064093

tation of values for normal equations for additions, and Table IV for retirements.

The normal equations for function A can then be completed as follows:

$$21.0000000\ a' + 3.6453586\ b' + 1.5984307\ c' = 3.9318000$$
$$3.6453586\ a' + 1.5984307\ b' + 1.2009757\ c' = 1.1691468$$
$$1.5984307\ a' + 1.2009757\ b' + \ldots\ldots\ldots = \ldots\ldots\ldots$$

(The third equation can be omitted in solving for a' because of the insignificance of the coefficient values.)

The solution of the normal equations for the addition ratios is found in Table V, and for the retirement ratios in Table VI. The explanation of solving the normal equations for the addition ratios is found below Table V.

Determination of Depreciation Rate

The asymptote of the addition ratios is found to be .0997, whereas the asymptote of the retirement ratios (Table VI) is .0138. In other words, the limiting values of these two cumulative ratios are approximately 10 per cent and 1.4 per cent respectively when x approaches infinity. The necessary data

TABLE V—ANALYSIS OF ADDITIONS—POLES AND FIXTURES ACCOUNT SOLUTION OF NORMAL EQUATIONS

	a^1	b^1	c^1	Col. 4	Col. 5	Col. 6	S
I	21.0000000	3.6453586					3.9318000
II	3.6453586	1.5984307					1.1691468
III	1.0000000	.1735883		.0476190			.1872284
IV	1.0000000	.4384837			.2743214		.3207220
V		-.2648954		.0476190	-.2743214		-.1334936
VI				-.1797653	1.0355584		.5039484
VII	5.7607494	1.0000000		.2743214			1.0785769
VIII	2.2805859	1.0000000			.6256136		.7314341
IX	3.4801635			.2743214	-.6256136		.3471428
X				.0788243	-.1797655		.0997490

Use a^1 = .0997

Explanation of Table 5

I. $21.0000000\ a^1 + 3.6453586\ b^1 + 1.5984307\ c^1 = 3.9318000$
Insert coefficients of a^1 and b^1 on line I (Omit c^1).

II. $3.6453586\ a^1 + 1.5984307\ b^1 + 1.2009757\ c^1 = 1.1691468$
Insert coefficients of a^1 and b^1 on line II (Omit c^1).
$1.5984307\ a^1 + 1.2009757\ b^1 \ldots\ldots = \ldots\ldots$
Omit third normal equation.

III. Insert reciprocal of (a^1 line I) in Column 4. Multiply coefficients in equation I by reciprocal. Enter products in a^1, b^1, and S columns respectively on line III.

IV. Insert reciprocal of (b^1 line I) in column 5. Multiply coefficients in equation II by reciprocal. Enter products in a^1, b^1, and S columns respectively on line IV.

V. Subtract line IV from line III. Explanation: Zero is subtracted from reciprocal in Col. 4 and reciprocal is subtracted from zero in Col. 5. (Thus Col. 5 line V is a minus quantity.)

VI. Divide columns 4, 5, and S by b^1, entering quotients on line VI.
Quotient in Col. 5 is cofactor of b^1.
Quotient in Col. S is the value of the b^1 constant.

VII. Enter reciprocal of (b^1 line I) in Col. 4 of line VII. Multiply coefficients in line I by reciprocal and enter in Columns a^1, b^1, and S.

VIII. Enter reciprocal of (b^1 line II) in Col. 5. Multiply coefficients in line II by reciprocal and enter in columns a^1, b^1, and S.

IX. Subtract line VIII from line VII. See explanation of line V above.

X. Divide columns 4, 5, and S by a^1, entering quotients on line X.
Quotient in Col. 4 is cofactor of a^1.
Quotient in Col. S is the value of the a^1 constant or asymptote.

TABLE VI—ANALYSIS OF RETIREMENTS—POLES AND FIXTURES ACCOUNT SOLUTION OF NORMAL EQUATIONS

	a	b	c			S
I	21.0000000	3.6453586				.2513000
II	3.6453586	1.5984367				.0333073
III	1.0000000	.1735883	.0476190			.0119666
IV	1.0000000	.4384837		.2743214		.0091369
V		-.2648954	.0476190	-.2743214		.0028297
VI			-.1797653	1.0355584		.0106823
VII	5.7607494	1.0000000	.2743214			.0689370
VIII	2.2805859	1.0000000		.6256136		.0208375
IX	3.4801635		.2743214	-.6256136		.0480995
X			.0788243	-.1797655		.0138210

Use a = .0138210

APPENDIX A

Table of x^{-2} & Sum x^{-2}

n	x	x^{-1}	x^{-2}	x^{-3}	Sum
1	1.0000000	1.0000000	1.0000000	1.0000000	4.0000000
2	1.0000000	.5000000	.2500000	.1250000	1.8750000
3	1.0000000	.3333333	.1111111	.0370370	1.4814814
4	1.0000000	.2500000	.0625000	.0156250	1.3281250
5	1.0000000	.2000000	.0400000	.0080000	1.2480000
6	1.0000000	.1666667	.0277777	.0046296	1.1990740
7	1.0000000	.1428571	.0204081	.0029154	1.1661807
8	1.0000000	.1250000	.0156250	.0019531	1.1425781
9	1.0000000	.1111111	.0123456	.0013717	1.1248285
10	1.0000000	.1000000	.0100000	.0010000	1.1110000
11	1.0000000	.0909090	.0082644	.0007513	1.0999248
12	1.0000000	.0833333	.0069444	.0005787	1.0908564
13	1.0000000	.0769230	.0059171	.0004551	1.0832953
14	1.0000000	.0714285	.0051020	.0003644	1.0768950
15	1.0000000	.0666666	.0044444	.0002962	1.0714074
16	1.0000000	.0625000	.0039062	.0002441	1.0666503
17	1.0000000	.0588235	.0034602	.0002035	1.0624872
18	1.0000000	.0555555	.0030864	.0001714	1.0588134
19	1.0000000	.0526315	.0027700	.0001457	1.0555474
20	1.0000000	.0500000	.0025000	.0001250	1.0526250
21	1.0000000	.0476190	.0022675	.0001079	1.0499945
Sums	21.0000000	3.6453586	1.5984307	1.2009757	27.4447651

are now obtained for the determination of the depreciation rate and the calculation of the fitted trends for the addition and retirement ratios.

The depreciation rate is determined by finding the geometric mean of the two asymptotes as follows:

$$d = \sqrt{a\,a'}$$

Substituting:

$$d = \sqrt{(.0138)\ (.0997)}$$

$$d = \sqrt{\ 00137586}$$

d = .03709 or 3.71% (Gross)

Net retirement ratio = .92597 or 92.597% (See Table I)

Net depreciation rate = .0371 x .92597 = .03435 or 3.44%

The final step in the study is to calculate the fitted trends for the addition and retirement ratios and to plot them on Chart A with the actual trends. Two schedules are made to plot the fitted trends for n number of years. The function of the curve for the addition ratios is

$$A = a' + b'^{x-1}$$

and for the retirement ratios

$$R = a + b^{x-1}.$$

The values of A and R are found in two schedules which are compiled below. After the points are determined for each year they are plotted on Chart A, together with the geometric mean (gross depreciation rate) of the two asymptotes. The value of b' constant is the quotient found in the last column of Line VI in Table V; the value of b constant is found in the similar column of Line VI in Table VI. Note, however, that b is a minus quanti (—.01068).

(*Continued on page* 89)

CHART A—SEE TABLES BELOW

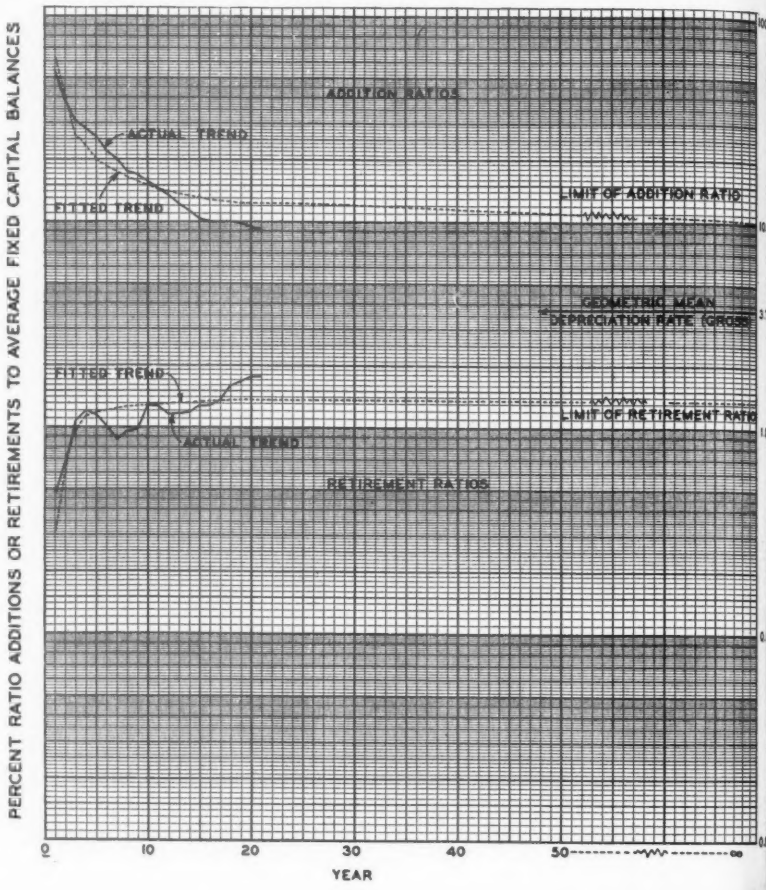


Chart A (Schedule 1)

Calculation of Fitted Trend for Additions

Function: $A = a^1 + b^1\ x^{-1}$

$A = .0997 + .5039\ x^{-1}$

n	a^1	b^1	x^{-1}	$b^1 x^{-1}$	A
1	.0997	.5039	1.00000	.5309	.6306
2	.0997	.5039	.50000	.2520	.3517
3	.0997	.5039	.33333	.1680	.2677
4	.0997	.5039	.25000	.1260	.2257
5	.0997	.5039	.20000	.1008	.2005
6	.0997	.5039	.16667	.0840	.1837
7	.0997	.5039	.14285	.0720	.1717
8	.0997	.5039	.12500	.0630	.1627
9	.0997	.5039	.11111	.0560	.1557
10	.0997	.5039	.10000	.0504	.1501
11	.0997	.5039	.09090	.0458	.1455
12	.0997	.5039	.08333	.0420	.1417
13	.0997	.5039	.07692	.0388	.1385
14	.0997	.5039	.07142	.0360	.1357
15	.0997	.5039	.06667	.0336	.1333
16	.0997	.5039	.06250	.0315	.1312
17	.0997	.5039	.05882	.0296	.1293
18	.0997	.5039	.05556	.0280	.1277
19	.0997	.5039	.05263	.0265	.1262
20	.0997	.5039	.05000	.0252	.1249
21	.0997	.5039	.04762	.0240	.1237

Chart A (Schedule 2)

Calculation of Fitted Trend for Retirements

Function: $R = a + bx^{-1}$

$R = .0138 - .01068\ x^{-1}$

n	a	b	x^{-1}	bx^{-1}	R
1	.0138	-.01068	1.00000	-.01068	.00312
2	.0138	-.01068	.50000	-.00534	.00846
3	.0138	-.01068	.33333	-.00356	.01024
4	.0138	-.01068	.25000	-.00267	.01113
5	.0138	-.01068	.20000	-.00214	.01166
6	.0138	-.01068	.16667	-.00178	.01202
7	.0138	-.01068	.14285	-.00153	.01227
8	.0138	-.01068	.12500	-.00134	.01246
9	.0138	-.01068	.11111	-.00119	.01261
10	.0138	-.01068	.10000	-.00107	.01273
11	.0138	-.01068	.09090	-.00097	.01283
12	.0138	-.01068	.08333	-.00089	.01291
13	.0138	-.01068	.07692	-.00082	.01298
14	.0138	-.01068	.07142	-.00076	.01304
15	.0138	-.01068	.06667	-.00071	.01309
16	.0138	-.01068	.06250	-.00067	.01313
17	.0138	-.01068	.05882	-.00063	.01317
18	.0138	-.01068	.05555	-.00059	.01321
19	.0138	-.01068	.05263	-.00056	.01324
20	.0138	-.01068	.05000	-.00053	.01327
21	.0138	-.01068	.04762	-.00051	.01329

Lively Interest in Current Problems Marks Meeting of Transmission & Distribution Committee

E. V. Sayles, *Chairman*

ONE of the best attended meetings of the Transmission & Distribution Committee in recent years was held at the William Penn Hotel in Pittsburgh, Feb. 11 and 12. There was a registration of 145, most of whom were members of the committee or representatives of electric light and power companies. A very active interest in the work of the committee was in evidence throughout the entire meeting and a more than usual amount of time was allotted to informal discussions on subjects of current interest and importance to operating companies.

The forenoon of the first day was devoted to a discussion of subjects related to underground systems, under the chairmanship of Mr. T. G. Hieronymus.

Mr. E. W. Oesterreich of the Duquesne Light Company presented a progress report on War Loading of Cables.

Doctor R. J. Wiseman, Chief Engineer of The Okonite Company, reported on a group of nine papers which were presented at a Cable Conference held under the auspices of the A.I.E.E. Technical meeting in January. The papers dealt with the emergency loading of power cable and the effects resulting therefrom. It appears that some power companies have set up emergency temperatures 10 to 15 deg. C. above the normal operating temperatures without finding, to date, any excessive increase in failure rate, although one company did report a very large increase in failure rate as a result of the emergency loading on 13 kv and 69 kv cables over a period of two years. The failures were all confined to sheath damage due to the movement of the cables. It is planned to have all the papers combined into one binder for distribution by A.I.E.E.

In making a progress report for the Subcommittee on Non-Oil-Filled Transformers, Mr. M. W. Ghen of the Duquesne Light Company said that in recent contacts with manufacturers there was no indication of a radical change in the non-inflammable liquid-filled and dry type of equipment except that the trend seems to be toward welding covers and eliminating, as much as possible, gaskets which appeared to be giving considerable trouble on this type of equipment. The same trend has been followed by some companies in the specifications for oil-filled equipment. He said that most of the use by utilities of non-inflammable, liquid filled and dry type equipment is still for station equipment rather than for distribution purposes, large numbers of both types being sold to manufacturing concerns for use in plants where fire hazards are a factor.

In a discussion of Dielectric Strength as Related to Time, Mr. R. W. Atkinson of the General Cable Corporation said that tests have been made which show strikingly the fallacy of the usual method of evaluating the voltage "breakdown" of cable samples. Tests on two samples were made at relatively low stress, but well within accepted limits, and extended for a very long time. With the accepted method of evaluation, these tests correspond to an "equivalent" stress of over 1100 volts per mil for one hour. Adjacent samples tested at a considerably higher voltage for much shorter time—but still within the range of practice—gave "equivalent" values of about 570 volts per mil. It is apparent that the accepted evaluation practice does not give a true correlation of "breakdown" tests.

While the conclusion is accentuated in this case by the fact that the long-time strength of these cables considerably exceeds any values previously reported even

Transmission and Distribution Committee in Session at Pittsburgh — Despite the Table Cloths this is not a Dinner or Luncheon meeting.

for laboratory made cable models, the results serve the more effectively to emphasize the conclusion that dielectric tests can be properly compared only if actually of comparable duration.

Mr. A. Bodicky of the Union Electric Company presented a final report on A.C. Network Operation for the years 1938, 1939 and 1940. This will be available as a printed publication as a report of the Transmission & Distribution Committee within the next few weeks.

An interesting paper on A Short Cut to Emergency Cable Ratings was presented by Mr. N. B. Walsh of the Duquesne Light Company. Mr. Walsh explained that one of the major problems confronting an operator who has had no occasion to be concerned about emergency capacities is that of arriving at a satisfactory method for determining dependable ratings within the limits of copper temperature that is safe for the conductor during an emergency. He reviewed briefly the fundamental relationships governing the calculations of emergency ratings and suggested a short cut whereby these ratings may be secured with greater ease and speed.

The remainder of this session of the Underground Group was devoted to a Round Table discussion of the following subjects:

(a) Reducing Inventories of Cable
(b) Methods Employed in Wholesale Removal of Cable for Re-use
(c) Reducing the Use of Tin in Joints
(d) Lead Burning Joints and Repairs
(e) Location and Repair of Sheath Breaks without Removal of Cable
(f) Mixing Cable Oils of Different Types and Manufacturers
(g) Experience with Oil Impregnated Paper Tape and Vacuum Treated Varnish Cambric for Splices
(h) Corrosion Problems

The afternoon session dealt with subjects concerning overhead transmission systems, including the running of an interesting motion picture film which showed the construction of a 230-kv wood pole transmission line in New York State. The construction of this line was carried out by the United States Engineers Office and was built in 1942. It is approximately 160 miles in length and is H-frame wood pole construction throughout.

Another short but interesting motion picture film showed the effects of an ice storm in southern Canada during December of 1942. This storm was said to have been the worst that has occurred in that territory in the past 50 years.

Mr. W. C. Schmidt, of The Commonwealth & Southern Corporation, presented a valuable paper describing some features of wood H-frame design. Making liberal use of lantern slides, Mr. Schmidt described the general outlines of a series of H-frames used since 1939. Impulse insulation levels and over-all mechanical strengths of the structures were covered in the paper. A series of full scale tests were described which were made to obtain comparative strength data on double plank crossarms using wood filler blocks or conventional steel fittings.

The paper also described certain design details which were of particular interest. Among these were a description of a wood plank pole shoe used to take care of uplift and compressive forces on angle structures and a new method of attaching high strength guys to poles, making use of standard timber connectors. Details were given of the type of sectional ground rods and ground rod couplings used in the effort to reduce footing resistance to the required minimum. The rods are driven to great depths and it was stated that the average depth for many lines is in the order of 60 feet with maximums ranging from 175 to 200 feet.

Considerable emphasis was placed on the importance of proper basic data in the design of important wood structures, and several curves of the strength of bolted joints in wood were described to illustrate the point.

Practically all of the forenoon session on Feb. 12 was taken up with a discussion of Current Carrying Capacity of Overhead Conductors. Mr. H. P. Seelye, Detroit Edison Company, explained that at the October 1942 meeting of the committee, the subject of the allowable current on overhead line conductors was discussed in several short papers. Subsequently, a subcommittee was appointed to collect all such available information and prepare a report. This work has been carried on to a point where it is expected that a report can be published within the next few weeks.

The subject has been approached from three general aspects—

1. The temperature which is permissible for the wire
   (a) To avoid too great reduction in strength
   (b) To avoid damage to the covering, if any
   (c) To maintain sufficient clearances
2. Conditions under which the critical load occurs
   (a) Ambient temperature, wind, and other weather conditions
   (b) Frequency and duration of the critical load
3. Load current which will produce the permissible temperature under the ass conditions.

Data have been collected from a nu ber of authorities on the annealing ch acteristics of copper, that is the rela between temperature of heating, du tion of temperature and loss of streng This characteristic is affected by seve conditions. The percentage of sil contained, the percentage of oxygen, a the amount of cold working of the me seem to have appreciable effect and av able data on their relative influence w be given.

The effect of weather conditions wire temperature is, of course, a maj factor. These conditions vary with di ferent localities but certain methods collecting and exhibiting data have be worked out. The choice of the value temperature and wind under which t critical load is assumed to occur will influenced considerably by the probab frequency and duration of that load. T probability of coincidence of the lo with the worst weather conditions w be much smaller for an occasional em gency load than for a regular day-to-d load.

Various formulae for calculating t load current in a wire which will pr duce a certain temperature under an a sumed ambient temperature and wi have been compared. Working cha have been prepared by which this cal lation can be easily carried out. The have been checked by test data which a available.

While complete data on the subj of current rating of overhead conduct is not available, it is believed that a r port can be issued which will allow su stantially correct values to be obtain The urgency of the need for these da makes it advisable to publish the rep as soon as possible without waiting f more complete studies and tests.

Mr. A. L. Malmstrom also of the D troit Edison Company followed M Seelye with a discussion supplement some of the points that Mr. Seelye h presented. He said that there are s some discrepancies in this study and th a number of factors, such as intermitt heating, effect of sun temperatures, di ference between bare and covered wi effect of impurities in the copper ele of joints and clamps, and the limiti temperatures on covered wire have n yet been investigated. He observed th thus far not much had been done other conducting materials, althou some information was available ACSR. Composite conductors such

ACSR and Copperweld offer complex conditions but as the committee is in need of such information as it can get immediately, it is hoped that all available data can be brought together and published in some form within the next few weeks.

Mr. L. R. Gaty, Philadelphia Electric Company, said that additional tests on clamp heating had just been completed by his company. Tests made in 1933 on a 2/0 copper conductor, a dead-end clamp and a suspension clamp showed that both types of clamp were consistently cooler than the conductor at all currents up to 600 amperes. This was confirmed by the 1943 tests and removes the doubt about local magnetic heating causing conductor distress at the clamps. An analysis of local weather bureau data is desirable before final conductor ratings are determined. There are very few hours per year when high ambient temperature and still air occur together. Such data will permit high ratings without danger of conductor damage.

Mr. Gaty pointed out that much of the material on conductor rating merely established the ceiling as in most cases limitations of other equipment or of voltage regulation did not permit conductor loading to reach its maximum rating.

Mr. L. M. Olmsted, Duquesne Light Company, said that in an investigation undertaken for his company several years ago he had obtained experience and laboratory data of considerable value in meeting certain operating conditions. The difference between medium hard-drawn and hard-drawn copper was investigated and considerable attention given to temperature effect on conductor clamps. It was found that some types of clamps had not been adequate for carrying high currents, although others had given satisfactory results. In several instances the data obtained confirmed that presented by Mr. Seelye.

A progress report was presented for Mr. A. E. Silver, Chairman of the EEI representatives on the EEI-NEMA Joint Committee on Standards For Distribution Transformers, which outlined the consideration given to this subject since the last meeting and mentioning the work which lies before the committee to do. A request was repeated for experience in the use of standard transformers, in particular any further substantial problems encountered in direct pole mounting where crossarms are present.

Several members discussed the plans now under way for listing excess materials and equipment and for the functioning of such organization as may be in charge of this activity. All expressed a desire to cooperate in every way possible with such agencies as may undertake this work in the interest of promoting the war effort.

An announcement was made of the forthcoming Specification TD-51—1942 for Low and Medium Voltage Pin-Type Lime Glass Insulators, which has been in the course of preparation by a joint committee consisting of representatives of the Edison Electric Institute and Glass Manufacturers. This specification will supersede TD-51—1937 in part (glass insulator portion) and TD-71—1937 in part (pin cavity and gage for glass insulators). This is now in page proof form and is expected to be available for distribution within the near future.

The afternoon session was presided over by Mr. G. H. Fiedler, Chairman of the Overhead Distribution Group. Mr. Fiedler opened the session with a discussion on transformer and line fuse failures, pointing out that one of the things that utilities can do during these times when material is scarce, is to review the distribution system to minimize fuse blowing. He pointed out that every blown fuse requires man hours of transportation in addition to the time that may be lost through service interruption to industrial plants. As one of the prime causes of fuse blowing is lightning, protection from this source of trouble is important to preserve existing equipment and minimize the demands for repairs and replacement. Mr. Fiedler said that this program had been carried on extensively in his system through 1942 and will be continued, as it has been shown to reduce interruptions and minimize travel.

Mr. H. L. Lowe, Ebasco Services Inc., discussed the subject of preventing transformer line fuse failures. He offered several suggestions helpful in minimizing fuse failures and gave performance data on overhead distribution transformers covering the past several years.

Several members discussed the problems arising from interconnection with industrial plants under the War Production Board Order No. L-94.

Mr. O. K. Cornell, Buffalo Niagara Electric Corporation, reported the progress made by the Joint EEI-NEMA Committee on Street Lighting Standards. This standard has been distributed for comment and on the basis of suggestions received has been revised prior to a second distribution. Mr. Cornell outlined the various details that had been changed and expressed the hope that this would receive general approval for use in the industry. He also explained that this is not necessarily intended to meet the conditions that have arisen due to the war situation, but was undertaken several years ago with a view to simplifying the equipment and material that is necessary to hold in stock in order to maintain and operate street lighting equipment.

Mr. J. H. Milbyer, Buffalo Niagara & Eastern Power Corp., discussed ground line preservation of wood poles. In 1938 his company decided to inspect and treat all the untreated poles in the Buffalo district. All of the actual work had been let out on contract, with the company supplying the material and making the pole inspections. From the results obtained thus far it is believed that treatment has given desired results. Evidence shows that at least six years of prolonged life per treatment can be expected.

Mr. A. S. Anderson, Ebasco Services Inc., gave a brief discussion on the mid-point grounding of series street lighting circuits. According to Mr. Anderson, this practice has the following advantages:

(a) In case of open circuit, quick restoration of service to about half of the circuit. This restoration may be done manually or automatically at a convenient point in the supply.

(b) Ease of location of ground and open circuit faults.

(c) Reduced hazard to life in case of contact with other grounded neutral supply circuits of higher voltage.

(d) Reduction in lamp burnouts due to grounding faults.

(e) Reduced lamp burnouts, due to contact or crosses with primary circuits.

(f) Reduction in potential stress to ground under normal operation and fault conditions which result in fewer insulation failures.

Mr. Anderson explained that his purpose in giving this discussion was to solicit descriptions of experience on the subject of mid-point grounding and also a kindred subject which has been suggested, namely "The Common Neutral As A Return for Series Circuits."

Chairman Sayles said that it was with deep regret that he announced the recent death of Mr. Nicholas Stahl who had been a member of this committee since the committee was formed. A resolution on Mr. Stahl's death was read and unanimously adopted. It appears on page 84.

SUGGESTIONS FOR AIR RAID WARDENS
Relating to
EMERGENCY CONDITIONS IN STREETS
Affecting
ELECTRIC SERVICE FACILITIES

The following suggestions have been prepared by the Accident Prevention Committee, Edison Electric Institute, for use by Air Raid Wardens who are not technically trained or who have not had previous experience in the handling of electric service facilities. They have been submitted to the Office of Civilian Defense with a recommendation for publication by the O.C.D.

PART I — GENERAL

Electric wires or cables which have fallen to the ground or are hanging within reach of pedestrians or traffic as a result of damage to electric systems by air raid bombings, or from other causes, should not be approached by anyone not specially trained to handle such wires or cables, except under conditions of extreme emergency. It must always be assumed that such wires or cables are "live" in which case they are dangerous and should be approached only in accordance with the precautionary measures as set forth in the following paragraphs. The voltage of the wire or cable cannot be determined by its size or other external characteristics and only duly authorized employees of the electric power company will know what the voltage is. Even so it must be remembered that low voltage shocks, such as can be received from an ordinary house circuit, can cause death under certain conditions and such conditions may be present unknown to you. In other words, *TAKE NOTHING FOR GRANTED.*

Should electric wires fall or wires or cables be broken and lay in exposed position, observe the following:

Keep everyone, including yourself, well in the clear. See that such fallen wires or cables or damaged poles are carefully guarded by means of rope or barricade, until utility repair crew arrives. Divert traffic if necessary.

Report conditions found to your control center immediately.

Stay on the ground. Never attempt to climb poles, towers or structures to investigate electrical incidents, to clear live wires or to extinguish electrical fires. Keep in the clear and wait for utility repair crews.

Treat all wires as live and dangerous. Telephone, telegraph, police and fire alarm systems or other low voltage wires may be crossed up with high voltage wires at or near the scene of the incident. Remember, also, that if metal or any other material that is a conductor of electricity comes in contact with an electric power wire it may become energized at the voltage of the power wire.

Wet ground is especially dangerous. Live wires lying in water or on wet surfaces may energize the surrounding ground or pavement. It is necessary under such conditions to stay even further away from the point of damage than under ordinary dry conditions. *Remember* water is a good conductor of electricity. For this reason do not use a fire hose or water hose fire extinguisher on or near live wires to extinguish fires.

Beware of the amateur electrician or other unauthorized person who offers his services in clearing the street of live wires. Unless help is necessary, allow no one to handle such equipment except an authorized utility company repair man.

PART II — CLEARANCE AND RESCUE METHODS

There may be occurrences which will require definite action by the warden when it would be out of the question to wait for the utility repair crew or to have the power shut off. For example, in severe raids utilities might find themselves short of personnel or be unable to reach the scene of trouble in order to clear all wires which have fallen. It may be that a fallen wire will interfere with vital traffic or be in a position dangerous to life and property. In such extreme emergency, wires can be moved out of harm's way by the use of a long dry stick, dry board, dry rope, dry clothing or other material which will not conduct electricity. If possible stand on a dry board in addition to using any of the above means.

Any attempt to rescue a person from contact with a live wire by one who is inexperienced in such matters is extremely hazardous. Great care must be exercised otherwise the rescuer may become a second victim of the accident. You must not touch any part of the victim's body until he has been freed from contact with the live wire. Do not touch any wire with your hands or body. *The rubber or braid coverings of such wires should not be depended upon for protection.* Of course, if the power can be shut off or the wire (on both sides of victim, if continuous) can be cut or broken immediately at the scene of the accident, this should be done before rescue is attempted.

It may be possible under some conditions to free a victim by pulling on the victim's clothing, if dry, such as coat, skirt, etc. When dry clothing is used to effect the rescue, as many thicknesses or as much length of such clothing as possible should be interposed between the victim's body and the rescuer. Linemen's rubber gloves are used by workers in the electric industry to handle some classes of live wires, but conditions under which they are used normally are carefully controlled. In the hands of inexperienced persons, under conditions likely to accompany air raids, they may not afford complete protection, though no doubt they would aid in performing a rescue safely.

Finally, it must be remembered that it is not possible to suggest any one method of rescue which is safe and fool-proof under all circumstances. It is only through special training, the use of adequate equipment and the exercise of great care that a rescuer may be assured of safety from electric shock.

In any case of electric shock, after the victim has been freed of the live wire, give artificial respiration as quickly as possible through the use of the prone pressure method as described in your Red Cross First Aid Manual, and call for medical aid.

SUMMARY

To summarize clearance and rescue methods:

Keep persons away from wire until arrival of repair crew or until the condition is properly guarded.

Have current shut off if possible or otherwise break the circuit to the victim.

If necessary to remove any wire or a victim from any live wire, use non-conducting material and keep clear of contact with wire or victim until freed.

Give artificial respiration to the victim immediately after removal from the wire.

Accident Prevention Committee Holds Winter Meeting

Air Raid Warden Suggestions Submitted to OCD

George S. Diehl, *Chairman*

THE winter meeting of the Accident Prevention Committee was held at the Gibson Hotel in Cincinnati, February 8 and 9, 1943. This meeting was well attended, although some of the members of the committee were prevented from attending on account of illness.

Mr. Campbell reported on the collection of employees accident statistics for 1941 and the plans under way for obtaining these data for 1942. He said that the 1941 data had been compiled and published as a report of the Accident Prevention Committee under date of December, 1942. It is designated as EEI Publication J9 and is a compilation of the data covering approximately 270,000 employees. 6,476 disabling injuries were reported with an exposure of 541,000,000 man hours. The frequency for the entire industry being 11.95 and the severity 1.98.

These data were collected in accordance with the method prescribed in the American Standard Z16.1 — 1937, "Method of Compiling Industrial Injury Rates." Prior to 1941 the Edison Electric Institute and the National Electric Light Association had collected accident statistics on the basis of the actual days lost per hundred employees per year, the lost time accidents per hundred employees per year and the fatalities per thousand employees per year. Accident data had been collected on these bases since 1923, the ratios being as indicated on trend chart published on page 7 in the February issue of the BULLETIN.

Some discussions have been held with the National Safety Council with a view to the statistics collected by the Edison Electric Institute being furnished to the National Safety Council so that the latter would not need to undertake the collection of this information. Mr. Campbell said that last December arrangements were concluded whereby this could be done and that the matter had been referred to the proper authorities of the National Safety Council and to the Accident Prevention Committee where it had received approval by both groups. He also noted that the forms for collecting the 1942 statistics had been mailed and that a number of replies had been received.

In connection with this discussion it was pointed out that the reports which had been received on the fatalities in 1941 should be of considerable value and interest and it was decided that these should be referred to Mr. D. C. Stewart to analyze for the committee.

Mr. Gliddon of E. D. Bullard Company explained the Rubber Lung, which is a device, as he said, to give the other half of the Schafer method of resuscitation, the idea being that although exhalation is compelled by the Schafer method, inhalation depends upon body resiliency. The Rubber Lung compels both exhalation and inhalation, the compelled inhalation being the object of this equipment.

There was some discussion regarding the need for immediate application of Schafer or pole top resuscitation and he brought out that upon arrival the use of the Rubber Lung was an accessory to those methods and should in no way interfere with the training or use of the technique of the Schafer or pole top methods.

Mr. Gliddon indicated that he intended to bring this equipment to the attention of recognized authorities on resuscitation.

The Subcommittee on the Safety Merit Award, of which Mr. E. J. Kreh is chairman, presented the certificate which will be used for the award. This was approved by the Accident Prevention Committee and the Subcommittee was authorized to proceed as promptly as possible to make the certificates available for the recognition of safety records already reported to the Institute. Further information on the award will appear in an early issue of the BULLETIN.

Mr. Stewart discussed the "Suggested Method for Collecting Data on Accidents" which had been mailed to the members of the committee under date of January 27 for comment and discussion. The method suggested by Mr. Stewart is the result of a great deal of discussion that has taken place during the past two years on the classification of accidents. It has been found that none of the methods tried thus far are satisfactory for our purpose and hence Mr. Stewart's efforts to get a classification code that is more suitable. Mr. Stewart said that after reviewing all previous efforts and carefully studying the criticisms that have been made, he was convinced that any plan which would enlist the cooperation of all committee members and others who might be interested in contributing data, a condition essential to obtaining the desired wide coverage, must meet the following conditions:

(a) The data called for must be simple, easily compiled and it must require very few man hours to prepare.

(b) The report must call only for facts established by the known events associated with the accident. These facts should be capable of being stated in such a way that they will mean exactly the same thing to the person studying and summarizing the report as they did to the person making the report.

Following a discussion by several members of the committee it was moved, seconded and carried that the committee proceed with the collection of data on accidents in accordance with the plan proposed by Mr. Stewart.

Mr. W. T. Rogers of Ebasco Services reported that the Suggestions for Air Raid Wardens, undertaken by the Committee, and completed since the last meeting had been sent to the Office of Civilian Defense with the recommendation that they be published with the view of making the suggestions of maximum usefulness to persons who ordinarily would not have had previous experience with electric facilities. These suggestions are reproduced on the adjoining page.

Mr. R. M. Godwin was unable to be present at the meeting but he had advised that the situation concerning linemen's rubber protective equipment had undergone little if any change since the committee met last October. Gloves, line hose, blankets, sleeves, cable bandages, cable end test caps and separators and insulating stools are still on the War Production Board's list of products for which rubber may be used. The allocations thus far have been sufficient to cover the demand for these products and there is nothing to indicate that reduc-

tions in the amount of rubber for such equipment are contemplated. However, all were urged to conserve stocks now on hand and keep rubber protective equipment in a good state of repair to reduce to a minimum the amount of new rubber that will be necessary for the use of linemen's rubber protective equipment in the industry.

Mr. H. H. Berman, Consolidated Gas, Electric Light & Power Co. of Baltimore, notified that he had conferred with representatives of the manufacturers of linemen's climbers at considerable length and had inspected the design of gaffs as these are received on new climbers. There appears to be no important difference between the gaffs of the two manufacturers which Mr. Berman had examined and in his opinion both are safe. It is only when the gaffs have been in service for a considerable time and linemen find it necessary to resharpen them that safety may be impaired. Mr. Berman requested that the members of the committee supply him with the number of cut-out accidents they had had, the type of gage used in inspecting gaffs, the type of file used in sharpening, who is required to sharpen gaffs and what the general experience has been.

There was considerable discussion concerning the article by W. T. Rogers entitled, "Charting the Course in Accident Prevention" which appeared in the February issue of the EDISON ELECTRIC INSTITUTE BULLETIN and those who had had an opportunity to read the article, complimented Mr. Rogers on the point of view he had taken and the approach he had made to this subject.

Mr. W. A. Buchanan, Appalachian Electric Power Company, who was the first chairman of this committee under the Edison Electric Institute and a chairman of the Accident Prevention Committee under the former National Electric Light Association, was present during the first day of the meeting. He favored the committee with a brief discussion giving the events which led up to the formation of this committee and the accident prevention and safety work in the electric light and power industry for the past several years. He referred particularly to the trend charts, referred to previously, concerning which he had taken an active part during the years when the accident rates within the industry were much higher than they have been during recent years. He also discussed some of the fundamentals in accident prevention and safety work as he had observed it in his own company operation and was of the opinion that job training in some form is the most probable answer to further reductions in accidents in our industry. He felt that within the near future with the present interest in safety and accident prevention as it is, we may expect to see a noticeable downward trend in the curves which show the accident ratios.

The committee was glad to have as one of its guests at the meeting M. D. C. Duncan, Chairman of the Public Utilities Section of the National Safety Council. Mr. Duncan said that he was anxious to see the organizati which he represented and this committ cooperate closely as they had many o jectives in common.

Chairman Diehl announced that t committee would hold its next meeti during the week of May 10 in Chica

Elevator Maintenance Bulletins

THE National Bureau of Standards is now issuing a series of bulletins dealing with the maintenance of elevators, with a particular view to wartime conditions and shortage of material. These bulletins have been prepared by the Executive Committee of the ASA Sectional Committee for the Elevator Safety Code. The first bulletin, "Elevator Wire Rope Maintenance," is published by the National Bureau of Standards as Circular 441. This deals with the method of prolonging rope life due to adequate lubrication, alignment of machines, equalization of tensions and similar methods and also suggests methods of decreasing total mileage to conserve cable life. The second of this series is entitled "Maintenance of Elevator Mechanical Safety Appliances" and is published as a circular of the National Bureau of Standards as C442. This bulletin covers items affecting the proper operation of governors, safeties and buffers. Governor items include clearances, driving-sheave wear, sluggish action, and condition of jaws and of governor rope. The functional requirements of the releasing carrier are discussed in detail. This is followed by a general paragraph on the function of undercar safeties. There are also paragraphs on cleaning and maintenance of safeties and a discussion of various commonly used types of safety equipment. These include instantaneous, flexible guide-clamp, wedge-clamp, and spring-actuated safeties. The need for periodic tests is stressed.

A short section on care and maintenance of guide rails and buffers is included.

These bulletins are written for the men in the plant and are essentially practical and are offered with the hope that they will result in increased life without sacrificing safety. Addition bulletins on hoistway doors and interlocks and e vator machines and brakes are now the course of preparation.

Both of these bulletins may be tained for five cents per copy from Superintendent of Documents, Wa ington, D. C.

Resolution on the late Nicho Stahl Adopted by T. and D Committee

WHEREAS, the late Nicholas St was an active, useful and highly spected member of this Transmission Distribution Committee from the ti of its origin to his death on Jan. 1, 19 and Past Chairman of the Switch G Committee and Power Generation C mittee of the A.E.I.C. and Past Ch man of the Prime Movers Commi of the former National Electric Li Association and

WHEREAS, a most valuable ser was rendered to the industry and to public and the art of engineering advanced through his ingenuity and tiring efforts while he was engaged c tinuously over a long period of years electrical work in the United States

WHEREAS, the members of committee have lost a sincere friend esteemed associate through his pass therefore,

BE IT RESOLVED that the Tra mission and Distribution Committee the Edison Electric Institute at its m ing held in Pittsburgh, Pa., Feb. 1943, hereby commemorates with resolution Mr. Stahl's high perso character and unswerving faithfulnes public service and his contribution to advancement of electrical engineer and to the work of this committee, be it further

RESOLVED, that these resoluti be entered in the minutes of this c mittee and be transmitted to mem of the family of Mr. Nicholas Stahl.

More Edison Medal Awards for Resuscitation

By Mae B. Woods
Secretary, Committee of Judges for the Awards

THIS is a continuation from the February issue of the report on Edison Electric Institute Medal awards for Resuscitation made in 1942. As noted in last month's ue, twenty-four awards, including the large Medal and iniatures, a record breaking number for a twelve-month pe- od, were presented to a total number of sixty-five employees, cluding members of line crews and individuals, of light and wer companies. Awards were made for resuscitations ac- mplished by both the Schafer Prone Pressure method and the Pole Top method.

The number of officially certified resuscitations in the elec- ic light and power industry has now reached 565. One hun- ed and fifty-one of these have been commemorated by Edison edals; in 414 previous cases the employees who effected suscitation received the Insull Medal of the National Elec- ic Light Association.

The Edison Electric Institute Medal was established by the Board of Trustees of the Institute during the year 1933 as an award to employees of electric light and power companies who have successfully resuscitated individuals suffering from electric shock, by the Schafer Prone Pressure method. The award was later broadened to include resuscitations made by the Pole Top method, a variation of the Prone Pressure method, and a comparatively recent development in resuscitation technique, which allows resuscitation to be started immediately, usually within a few seconds after the shock has been received. The award is designed to serve as recognition of the performance of the act and to encourage and maintain interest in the training of employees in resuscitation.

The following accounts of circumstances attending the acts of resuscitation and presentations of the awards concludes the report for 1942.

WAYNE H. LUOMA

AYNE H. LUOMA and LOUIS F. SEGA
Minnesota

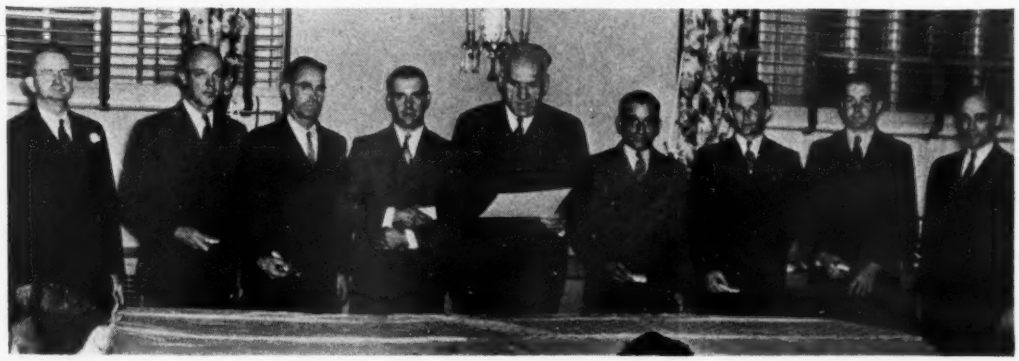
Wayne H. Luoma and Louis F. Sega, line- employed by the Minnesota Power and t Company, Duluth, Minn., were work- under the direction of Foreman Wm. vena on March 23, 1942, on a private right of way near the Village of Calumet. In attempting to remove a tie wire holding circuit wire to an insulator before the circuit was reported deenergized, Alfred Quaal came in contact with a 23,000-volt conductor. Luoma and Sega immediately realized Quaal's need for help, the latter having fallen unconscious in his safety strap. They worked together to place Quaal in position for pole top resuscitation, which Luoma immediately administered, being in a more favorable position. When Quaal was breathing naturally Sega fastened a hand line to Quaal's belt, and three groudmen who were at the foot of the pole lowered Quaal to the ground. Quaal was immediately laid prone and assisted in his breathing by the application of artificial respiration given by Louis Ruparcich.

At a safety meeting of the range employees of the Minnesota Power and Light Company at Eveleth, Minn., on October 8, 1942, Mr. C. C. Boswell, Vice-President and Chief Engineer of the Company, presented the Edison Medal and Certificate to Messrs. Sega and Luoma, and a Certificate of Assistance was granted to Louis Ruparcich, who is now serving in the armed forces of the United States.

LOUIS F. SEGA

FREDERICK LINE CREW
Maryland

On February 24, 1942, the Frederick Line Crew of The Potomac Edison Company was engaged in work on the Ridgeville-Damascus Highway, near Ridgeville, Md.



FREDERICK LINE CREW, Potomac Edison Company, receives medals and certificates from R. Paul Smith, center President of the Company.

CUMBERLAND LINE CREW receives medals and certificates from R. Paul Smith, President of the Company.

Wilbert H. Rinehart, lineman, had climbed a thirty-foot pole to untie three wires energized at 2300 volts in preparation of transferring them to a new pole. When Rinehart was about shoulder high with the cross arm he fastened his safety belt around the pole and before putting on his rubber gloves he presumably attempted to adjust his position to one a little more convenient for his work. In so doing he laid his left hand on top of the secondary rack and the secondary grounded wire and as he reached for the cross arm to help lift his weight, his right hand, which was covered only by an ordinary working glove, touched the outside phase wire. He fell clear of the contact and slumped in his belt.

Ira Stottlemyer, Foreman of the gang was standing at the bottom of the pole with William Poole, second class lineman, and H. Mullican and G. M. Spangler. Poole and Mullican climbed the pole and lowered Rinehart with a rope to the ground. Rinehart showed no signs of consciousness while being lowered. Artificial respiration by the prone pressure method was begun at once and in a very short time the victim recovered but struggled violently and had to be restrained while artificial respiration was continued as an aid to his breathing. On instructions of the Doctor, who had been called, artificial respiration was continued for about twenty minutes more, following which the victim was removed to the Frederick City Hospital.

At a gathering of employees of the Frederick District of The Potomac Edison Company on October 21st, 1942, President Paul R. Smith presented the Medals and Certicates to the Line Crew.

CUMBERLAND LINE CREW

Maryland

The Cumberland Line Crew of The Potomac Edison Company, under the foremanship of Marvin L. Rice, was installing a double four-pin crossarm and transformer on a pole located about four miles from Cumberland, Md., on May 1, 1942, at 9:05 a.m. Harvey W. Simons, lineman, climbed the pole to assist lineman R. H. Ambrose who had covered the hot wire with rubber hose and untied the ground wire, which was not covered. Upon reaching the brace which supported the crossarm Simons fastened his safety strap and was apparently reaching around for his rubber gloves when his left spur cut out. This unbalanced position swung him to the left and backwards where he made contact with the hot wire at a point beyond the point of rubber hose protection. At the same time his right hand and forearm touched the ground wire.

Ambrose immediately knocked the wires away from Simons who slumped unconscious in his safety belt. After passing a hand line over the crossarm Ambrose fastened it to the "D" rings of Simon's body belt and with the assistance of the men on the ground he was lowered and laid in position for resuscitation by Foreman Rice, groundman Valentine and Chester Ford. Artificial respiration was immediately begun by Foreman Rice, who was later relieved by Edgar F. Shatzer, truck driver.

Mr. R. Paul Smith, President of The Potomac Edison Company, presented the Edison Electric Institute Medals and Certificates to the Cumberland Line Crew at a dinner at the Queen City Hotel on October 21, 1942.

JEROME L. HOCK

Maryland

Jerome L. Hock, lineman of the Consolidated Gas Electric Light and Power Company, Baltimore, Md., was working in a three men gang under the direction of John Shipley which was assigned the job of replacing a temporary expulsion fuse box with a permanent box on June 23rd, 1942 at a pole on Arcadia Road, Anne Arundel County, Maryland. When the gang reached the location Foreman Shipley placed the of the new expulsion box on the tail of the truck and Hock started to ass it. After Foreman Shipley had made rangements with a nearby customer short service outage, he got his r gloves, sleeves, handline and tools from truck and climbed the pole to ar replacement of the temporary fuse Hock, in a short time, completed his and also climbed the pole. Both Shipley Hock had on rubber gloves and sleeve were in position on opposite side of pole. Truck driver Mead had sent up eral items to Shipley in the tool bag while waiting for further calls from men on the pole suddenly heard a buz sound on the pole and saw Shipley bu around the head. Hock pushed Shi feet so that he fell back in his belt and mediately placed him in position for Top Resuscitation. Mead immediately an emergency telephone call reporting accident to the telephone operator who moned an ambulance. When Mead ret to the pole Hock was still working Shipley who was showing signs of reco By means of a hand line Mead low Shipley to the ground. Hock followed down and Shipley was laid in a prone tion and artificial respiration given by prone pressure method. Shortly there Shipley recovered sufficiently to be tak the hospital.

The presentation of the Edison Medal Certificate to Mr. Hock and a Certificat Assistance to Mr. Mead took place on vember 11, 1942, in the office of Mr. Ch M. Cohn, President of the Consolidated Electric Light and Power Company of B more.

PAT VANCE

Wisconsin

On April 2, 1942, at a point 2½ m north of Waukechon, Mich. Substation. Vance, lineman of the Wisconsin Mich Power Company, was working with a crew under the direction of Foreman H hold Pasch on a two-wire 2400 volt r farm wire. While climbing the pole to in position for his work Harold Pa lineman, another member of the crew, cidentally came in contact with one of

JEROME L. HOCK, Consolidated Gas Electric Light and Power Company of Baltimore. Left to right: Kenny Jones, John A. Mead, Charles M. Cohn, President of the Company, Mr. Hock and John S. Shipley.

PAT VANCE receives medal from the Honorable John Goodland, Jr., Mayor of Appleton, Wisc.

e wires and simultaneously with a nded guy wire. Pasch was rendered un- cious and fell about four feet to a point re his safety belt caught on a horizontal wire. Vance went immediately to Pasch's tance and administered Pole Top Re- tation.

ith the assistance of Wilford Kuhn, e continued artificial respiration while ging Pasch to the ground at which time as found to be breathing naturally. He placed on a blanket and observed until ysician arrived, after which he was re- ed to the hospital.

r. Vance was presented with the Edison al and Certificate at a Veteran's Meet- in Appleton, Wis., on December 28, . The presentation was made by Mayor Goodland, Jr., before an audience of undred and fifty persons.

POWERS' LINE CREW

Florida

he Powers' Line Crew of the Florida ic Service Company consisting of Fore- H. "Mickey" Powers and linemen E. L. n, V. B. Crenshaw, M. S. Coleman, . Dease and W. W. Nettles and Alex all, truck driver and James Hall, groundman, started work on May 13, 1942, on the No. 17 line running between DeLand and DeLeon Springs Substation to make much needed repairs. The work was being done with the use of hot line tools with which all members of the crew were familiar.

In accordance with working arrangements Foreman Powers would call the dispatcher each morning and have his tag put on the line switch thus making the line non-automatic and preventing the line from being reclosed if it should trip out. The ground relay was set low so that the switch would kick out should the line get a low ampere ground.

While Powers was at the telephone at 10:26 a.m. on a matter pertaining to the work, Dease working with a hot stick on one of the 33,000-volt conductors slipped and fell, probably due to one of his spurs cutting out. Because of his position he landed on the lift stick and his shoulder came within 2 inches of the metal head on the stick. The 33-kv arced to his shoulder and his shirt and sleeve were set on fire. Tison extinguished these flames when he pulled Dease off the stick and in a few moments Crenshaw, who was also on the

RUSSELL E. PORTER, Southern California Edison Company, right, receives medal from Harry J. Bauer, President of the Company.

POWERS' LINE CREW, Florida Public Service Company, receives medals and certificates from H. R. Cloud, left, Vice-President of the Company.

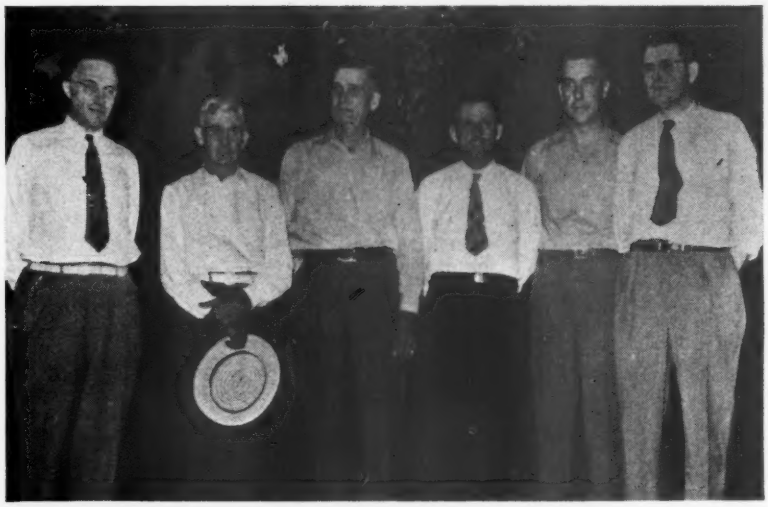
pole, started Pole Top Resuscitation. Dease started to breathe naturally in about four to five minutes. At the time of the contact the oil circuit breaker tripped and the line was de-energized. Artificial respiration was also performed by Coleman and Nettles and assistance was rendered to the crew by two young boys, names unknown, who helped pull the hand line while Dease was being lowered and placed a tarpaulin on the ground on which he was laid. Dease was later removed to the hospital.

The Powers' Line Crew were presented with the Edison Medals and Certificates by Mr. H. R. Cloud, Vice-President and Manager of the Florida Public Service Company at Orlando, Fla., on January 5, 1943.

RUSSELL E. PORTER

California

On February 26, 1942, at 3:45 p.m., Lawrence Gansey, a first class lineman of the Southern California Edison Company, Ltd., Los Angeles, Cal., was engaged in installing transformers on a pole-top platform and



LEAVENWORTH LINE CREW, Kansas Electric Power Company. Left to right: R. W. McClure, President of the Company, A. Tony Hereford, Samuel T. Harbit, David O. Taylor, Louis Spears, A. W. Johnson and Glenn O. Paden.

pouring oil into a pole-type oil circuit breaker. A metal ferrule of a live line tool suspended to one of the conductors contacted a metal crossarm brace. Crawford, one of Gansey's fellow workmen, was standing above the oil circuit breaker and completed a circuit through his body from the energized crossarm brace to a hanger of the oil switch. Gansey, who was pumping oil into the circuit breaker, and working below Crawford, touched the oil circuit breaker case with his left hand while his left foot contacted a ground on the pole supporting the transformer platform. Crawford was the less seriously injured of the two, but Gansey was rendered unconscious and required resuscitation.

First class lineman R. S. Jerzykowski cleared the circuit by removing the live line tool from the conductor where it was hanging and Gansey slumped over backwards in his safety. First class lineman Russell E. Porter and Frank W. Soto, in charge of the work, were working on the roof of an adjacent house when they heard Gansey groan. Soto and Porter descended from the roof, and Porter put on his tools, climbed the pole, and with the help of Jerzykowski got Gansey in position and gave Pole Top Resuscitation. After Porter started his work on the victim, Jerzykowski checked his tongue and found it back in his throat, which he cleared. After working for about two minutes, Gansey gasped for breath and Porter reported that he was breathing. After waiting for some four or five minutes, Porter and Jerz kowski tied Gansey on the hand line and lowered him to the ground. Gansey was still unconscious but breathing. A doctor was on hand when the victim reached the ground and he took charg was later removed to a hospital.

Mr. Harry J. Bauer, President Southern California Edison Company presented the Medal and Certificate Porter on November 4, 1942, at a cer before company employees at Mon Cal.

LEAVENWORTH LINE CRE

Kansas

While the Leavenworth Line Cr The Kansas Electric Power Co Lawrence, Kansas, was putting on c for power fuses on a station bus a a.m, August 25, 1941, Foreman Sam Harbit was standing on boards laid three-inch pipes and transferring blankets from one bay to another wh fell across a 2300 volt (to ground Linemen David O. Taylor, Louis B. S Tony Hereford and Glenn O. Pade present and assisting in this work. ford heard a noise and looking up sa bit fall across the bus. Spears quickly around the end of the bay and rush the operating board where he open the switches. Taylor and Paden re Harbit to the floor and Taylor a prone pressure resuscitation. It was minutes before Harbit showed signs and three minutes later breathed w assistance. In the meantime an amb arrived and he was removed to the ing Hospital.

At an outdoor gathering on Sep 15, 1942, of some one hundred and five people, made up of Kansas E Power Company employees, their fa and invited guests who represented h other small industries in Leavenworth sas, the Edison Medals and Certificate presented to the Line Crew by Mr. A W. Johnson, Manager of the Compan

CHARLES E. McCOY

Pennsylvania

On June 23, 1942, at 3 p.m., li James B. Sheridan, employed by the delphia Electric Company, while cons

CHARLES E. McCOY of the Philadelphia Electric Co., receives medal from H. B. Bryans, Executive Vice President.

EDWARD D. LEININGER LINE CREW, Philadelphia Electric Company. L right: H. B. Bryans, Executive Vice President; M. W. Merkel, E. D. inger, J. E. Grant and W. Rulon.

tribution transformer on a newly built volt, single-phase primary at Buckley and Knight Road, Lower Gwynedd, gomery County, Penna., received a which rendered him unconscious. arles E. McCoy, Foreman, returning the line truck about seven spans away Sheridan on the ground with his belt around the pole. He was wearing rub- sleeves and one rubber glove. The pre- tion is that he had been working with elt around the pole below the secondary McCoy freed Sheridan from his belt tools, placed him in position and ap- artificial respiration. After about seconds Sheridan was able to breathe out assistance, and later he was taken e Elm Terrace Hospital.

investigation revealed that the line on Sheridan had been working was sup- to be dead, but it had been energized gh an unauthorized connection made building contractor. It was presumed Sheridan made contact with a primary with his head, while his right hand was ntact with a grounded surface.

e Medal and Certificate were awarded Mr. McCoy on June 23, 1942, by Mr. Bryans, Executive Vice-President of Philadelphia Electric Company.

VARD D. LEININGER—LINE CREW

Pennsylvania

hile making tap connections at a trans- er to secondary wires, Joseph F. Bain, a class lineman in the Edward D. Lein- Line Crew of the Philadelphia Electric pany, Philadelphia, Pa., received a shock a 230 volt (115 to ground) single e, 60 cycle light and power circuit. Bain at work on a pole about 9:55 a. m. on 16, 1942, when he was heard to make sping noise. He stood erect for a mo- and then fell across the power sec- aries. Jack Grant, a member of the crew, bed through the crossarms and attempted lear Bain from the circuit. After three pts he succeeded and Bain hung in his y strap. Grant then started to get in ion to administer Pole Top Resuscita-

TRUMAN HENRY receives medal from Charles Czeschin, Vice President, Missouri Public Service Company.

tion, but before he could do so Marvin Merkel, another member, got into position and started to apply pressure. Bain's belt, rubber gloves, and hooks were removed and a rope was fastened about his chest. Resuscitation was started within thirty seconds after Bain received the shock and continued for fifteen seconds before there were signs of life. The Pole Top Method was continued for four minutes when he was lowered to the ground and Prone Pressure Method of Resuscitation continued for five minutes more. About forty minutes later he was removed to a hospital.

Mr. H. B. Bryans, Executive Vice-President of the Philadelphia Electric Company presented the Medals and Certificates to the members of the Crew on Dec. 16, 1942.

TRUMAN HENRY

Missouri

Sam L. Carney, groundman of the Missouri Public Service Corporation, Warrensburg, Mo., was sawing down a small tree with a hand saw when he received a shock from a 66,000 volt (38,000 to ground), three phase, 60 cycle transmission line. After receiving the shock, which apparently came through the tree, Carney walked a few steps, sat down and lost consciousness. Resuscitation was started immediately by Truman Henry who was working with him, and in fifteen minutes there was evidence that Carney was breathing. The injured man received a small burn on the right forefinger and a severe shock. The path of the current through the body being from the right hand to feet. Shortly after he was removed to a doctor's office at Pleasant Hill, Mo.

A dinner was given for Mr. Truman on Dec. 18, 1942, at Warrensburg, Mo., and the group consisted of district and general office employees as well as friends. Mr. Charles Czeschin, vice-president of the company presented the Edison Medal and Certificate to Mr. Truman, and Mr. R. J. Green, president, presented him with a gold watch as an award from the company.

A Test Case Computing Depreciation

(*Continued from page 78*)

Conclusion

n examination of three group ac- ts of the company shows the follow- variations when compared with the allowed by the Bureau of Internal enue.

oup Account	*Dep'n Rate Asymptotic Method (Net)*	*Dep'n Rate Allowable*	*Variation*
and Fixtures	3.44%	3.75%	+ .31%
head Conductors	2.95%	3.25%	+ .30%
rs	3.27%	3.00%	− .27%

lthough other tests were made, the e results give one an idea of the t variation between the established the asymptotic rate. The established shows and upward bias in the Pole Fixtures and Overhead Conductors unts and a downward bias in the ers account. About an equal varia- was found in the tests that were e. The conclusion reached in the y was that the asymptotic method resulted merely as a check on the depreciation rate allowable at the present time in the group accounts of the company. There was not sufficient discrepancy between the established and asymptotic rate to support the contention that the present depreciation schedule should be revised. The variations were so negligible that it was believed that they could easily be accounted for by conditions peculiar to the company or account.

Any method for computing depreciation under the group plan has its limitations because of the difference in the mortality characteristics and the realizable net salvage value of the units of property, and of the differences in the rate of growth of the account and in the age distribution of the units in service. The asymptotic method is no exception.

Granting that the asymptotic method can be used as a means of testing the depreciation rate allowable to a company, the question of its application as the established rate was found to have several weaknesses as compared to some of the other generally adopted methods. The volume of calculation is excessive and complex, especially when one finds it difficult to obtain a pre-constructed table of x^{-n} and Sum x^{-n} and has to devise one himself. Furthermore the general accountant is not familiar with the normal equation and its solution. The asymptote under the group plan cannot be applied until special data have been obtained covering an experienced cycle of at least eight years or more. It was believed in this study that the first few years of experience in each of the accounts carried so much weight in the cumulative addition and retirement ratios that the ratios did not have any significance until a cycle of eight or ten years had been established.

How Georgia Power Company is Expanding Service Program to Meet Wartime Needs

By John H. Stevens
Georgia Power Company

AN expanded program of customer services to meet wartime needs and conditions will be one of the principal activities of the Georgia Power Company in 1943.

Along with widened services to rural, commercial and industrial electric customers for the special purpose of aiding them to meet problems created by the war, an entirely new group of 60 customer service representatives will go into action to work with the residential and small commercial electric customers. This new phase will become effective after the men selected for the work have been given a special course of training.

Service Representatives

The shock troops of the new program will be former merchandise salesmen who now become customer service representatives. "Even though appliance selling has almost stopped, we have a bigger selling job than ever before," Vice President C. A. Collier comments. "We will sell the company, by new ways of demonstrating its usefulness to the public."

Each of the customer service representatives will be responsible for a certain area, with the duty of helping to make our service more satisfactory to the residential and small commercial electric customers. They will adjust complaints. But that is not their main job. The number one item on their list of duties is to prevent complaints, to seek out causes of dissatisfaction and clear them away before they can grow up to the stature of complaints.

The customer service representative will also work in fields that are not related to complaints. He will carry to our customers the helpfulness which the company can, and should, give to the people who make our business possible by buying our service.

Working for Customer

He will show customers how to get the most good out of the appliances they have. He will see that those appliances are in good repair. He will make what repairs he can himself on the customers' premises. Those that he cannot handle, he will report to the appliance repair department, stating the nature of the repairs needed, and thus simplifying the work of the repair department whose job will become increasingly burdensome as time goes by and the thousands of appliances now on our lines begin to wear out.

In short, the customer service representative will be working for the customer.

Thorough Training

To perform such a function, the customer service representative must be thoroughly trained in many phases of the company's business.

The customer service representatives are now receiving that training at a series of schools being held in Atlanta under the supervision of Howard J. Wilson. There will be a three-day school each week until all of them have been trained—about the middle of February.

These classes will cover the 10 subjects contained in the customer service representatives' manual which will be furnished to each man. The subjects are: The customer service program—its aims and purposes; history and policies of the company; fundamentals of electric service; rates; lighting, including the science of seeing, home lighting, and commercial and industrial lighting; home service; dealer cooperation; rural service; industrial power; and appliance repairs.

Instruction in these subjects will be conducted by key people from the departments concerned.

When their formal schooling has been completed, the men will return to their home territories and spend some time working with the lighting and industrial power engineers, the home economists and appliance repairmen, in order to familiarize themselves with the practical work of these people.

The customer service representative will then be a full-fledged good will ambassador without portfolio.

While residential and small co cial customers are the groups to the new customer service program marily directed, it is paralleled work of our industrial develo power engineering, lighting engi and rural service departments, wh adjusted their activities to fit wa ditions, and with them the watch is helpfulness to customers.

The industrial and power depar are assisting Georgia Power Co customers in getting war contract have helped in formation of po small industries to get groups enough to go after war orders on mary contract basis instead of dep on sub-contracts. These activities been so successful that similar plans been utilized by the WPB in other of the nation.

The company's lighting engineer been rendering important services dustrial and commercial customer many instances they have prepare lighting layouts for Georgia's new camps, airports, and war plants. men have also been invaluable in h out customers maintain their e lighting facilities at peak efficiency.

The importance of food in thi looms ever larger and our rural neers are helping Georgia farmer win the battle of greater agricul production. With the growing sho of manpower on the farm, the far electrical equipment becomes more able than ever—and he is able to this equipment in shape with the h our rural engineers.

These men have also done veoma vice in working with the various and county agricultural agencies the promotion of home-made food hydrators.

Appliance Repair

Our appliance repair department been doing an increasingly difficul and will be called upon to do a stil ger one as the customer service plan rolling and supply of new appli

(*Continued on page 92*)

PERSONALS

CALVIN T. HARMON has been elected controller of the Philadelphia Company, the Duquesne Light Company, and the Equitable Gas Company. Mr. Harmon entered the employ of these companies April 11, 1927, in the capacity of Statistician. On Nov. 1, 1938, he became Chief Accountant of the Statistical Division, and in September of the following year he advanced to Chief of the Statistical Division. On Dec. 19, 1941 he was made an Assistant Controller. Previous to his association with these companies, Mr. Harmon was employed as a Cost Accountant with the National Metal Moulding Company, and later he was engaged as a Public Accountant and Auditor with Collins and Company, and Haskins & Sells, both certified public accountant firms.

C. FLOYD NAGLE has been appointed general manager of the Scranton Electric Co., Scranton, Penna. to succeed the late Duncan T. Campbell. Mr. Nagle spent two years with the Westinghouse Electric and Manufacturing Co. at East Pittsburgh and one year as engineer with the Pennsylvania Coal Co. before entering the utility field. In 1907 he became identified with the Citizens Electric Illuminating Co., Pittston, Pa. as operating manager, remaining in that position until 1917. He became associated with the Scranton Electric Co. through merger of Citizens Electric, in 1920 becoming superintendent of distribution and transmission. Six years later he was made general superintendent.

Mr. Nagle was born in Mt. Corry, Ohio, and received his engineering education at Lafayette College.

NEVIN E. FUNK, vice-president in charge of engineering of the Philadelphia Electric Company has been nominated for president of the American Institute of Electrical Engineers, succeeding Harold S. Orborne, American Telephone and Telegraph Company to take office Aug. 1, 1943.

T. C. WESTCOTT, engineering manager, and HAROLD H. SCAFF, controller, have been elected vice-presidents of Ebasco Service, Inc. service organization for the Electric Bond and Share Company.

Mr. Westcott has been identified with the Bond and Share System since 1911 and Mr. Scaff since 1922.

J. B. PORCHER, safety director of the Ohio Edison Co., Akron, Ohio has been named chairman of an executive committee to establish a safety council in Akron.

STORRS M. BISHOP has been appointed resident manager of the New York Power and Light Corp. at Albany. Mr. Bishop has been connected with New York Power and Light since his graduation from Union College in 1926 and has been manager of the Hudson district for the past six years. He first served in the Schenectady district, but in 1930 was transferred to Glens Falls, where he was engaged in power sales activities. In 1933 Mr. Bishop was appointed resident manager of the Port Henry area and three years later was transferred to Hudson.

KENNETH P. APPLEGATE, general manager of the Hartford Electric Light Company, has been elected a vice-president. He will continue in his former post, with two titles combined.

RAYMOND A. GIBSON, lately assistant commercial manager of the Hartford Company, and more recently assistant superintendent of its Dutch Point steam plant in responsibility, has been appointed assistant to vice-president R. D. Cutler, who has general executive charge of commercial developments. L. H. KNAPP continues as commercial manager.

E. J. BECKETT, financial assistant to President J. B. Black of the Pacific Gas and Electric Company has been appointed treasurer of the company. Mr. Beckett joined the P. G. & E. in 1915 as secretary to the late A. F. Hockenbeamer, who at that time was vice-president and treasurer of the company. In 1920 he was made assistant treasurer. When Mr. Hockenbeamer became president, Mr. Beckett was made his financial assistant, a position he has occupied continuously since that time, serving in the same capacity for President Black. D. H. FOOTE, who acted as secretary-treasurer for the last 15 years, will continue in his capacity as vice-president and secretary. Mr. Foote is also a director.

HENRY B. HARDIN, formerly assistant to the general superintendent of the Puget Sound Power and Light Co., Seattle, has been appointed assistant to the vice president.

S. R. REQUE, who for some years has served as design engineer of the Pennsylvania Power and Light Co., Allentown, has been appointed chief engineer, succeeding the late Nicholas Stahl.

Mr. Reque is a graduate of the University of Minnesota, with the degree of E.E. His early professional activities were in the Middle West as an independent consulting and construction engineer. In 1910 he transferred his interests to the East to take a position with the New York Edison Company during the modernization of its Waterside No. 1 station. In 1912 he accepted a position with one of the predecessor companies of Pennsylvania Power and Light Co. and has acted in engineering capacities with this organization to the present time.

ALTON T. LITTLEFIELD, commercial manager, Central Maine Power Company, Augusta, Me., has been appointed state chairman of the Maine War Bond Staff.

GEORGE E. QUINAN, formerly chief engineer, has been advanced to chief consulting engineer of the Puget Sound Power and Light Co., Seattle, Wash. In that capacity he will be responsible for all engineering activities of the company. MAGNUS T. CRAWFORD has been appointed chief engineer of the company, in charge of the work of the general engineering department. This plan will relieve the consulting engineer of the additional load of responsibilities which have been brought about by the war program.

Mr. Quinan has been connected with the Puget Sound system since 1904, when he started with the Columbia Improvement Company on the construction of the Electron hydroelectric development. He held numerous positions of responsibility with the Puget Sound company before his appointment as chief engineer.

Mr. Crawford started his engineering work with the Snoqualmie Falls Power Company in 1906 and later became con-

nected with the Puget Sound Power and Light Company. He was made assistant chief engineer in 1936 and has continued in that capacity until his present promotion to chief engineer.

GEORGE W. ALLISON, for many years connected with the Edison Electric Institute together with various joint EEI and NEMA industry programs, has become associated with Kenneth A. McIntyre, consultant in industrial relations, with headquarters at 2 Rector Street, New York. Dr. Allison will be closely identified with supervisory training and development programs for a number of operating utility companies.

FLORENT E. VERDIN, for many years Personnel Manager of Central New York Power Corporation of the Niagara Hudson System, has also become associated with Kenneth A. McIntyre, consultant in industrial relations, with headquarters in New York City. Mr. Verdin is engaged in job classification programs and in studies for improvement of personnel departments of several operating utility companies.

EDGAR S. HAYMOND has been elected Treasurer of West Penn Power Company, following the resignation of W. R. Hinchman who recently joined Miller and VanWinkle, Inc., Paterson, N. J. Mr. Haymond has been in West Penn's employ since 1915, with the exception of a year's service in World War I. In 1921 he was named as the Company's Statistician, and in 1928 promoted to the Assistant Treasurership. He will also serve as Treasurer of West Penn Railways Company, Allegheny Pittsburgh Coal Company, Ohio County Fuel Company, West Penn West Virginia Water Power Company, Windsor Coal Company, and Windsor Power House Coal Company, and continue his duties as Treasurer of The Potomac Transmission Company, West Virginia Power and Transmission Company, and West Penn Securities Department, Inc.

F. D. HAYES, Credit Manager, has been elected Assistant Treasurer of West Penn Power Company and West Penn Railways Company; and Herbert Hunt, Assistant Treasurer of West Penn West Virginia Water Power Company, and West Virginia Power and Transmission Company. Mr. Hunt continues to serve as Assistant Treasurer of West Penn Securities Department, Inc.

CONVENTIONS AND MEETINGS

MARCH

25-26 Southeastern Electric Exchange, Engineering and Operating Section, Henry Grady Hotel, Atlanta, Ga.

APRIL

9-10 Midwest Power Conference, Palmer House, Chicago, Ill.
16-17 Missouri Association of Public Utilities, Elms Hotel, Excelsior Springs, Mo.
20-23 National Electrical Manufacturers Association, Palmer House, Chicago, Ill.
26-28 American Society of Mechanical Engineers, Hotel Black Hawk, Davenport, Iowa.
28-30 Missouri Valley Electrical Association, Annual Engineering Conference, Continental Hotel, Kansas City, Mo.

MAY

10-14 National Fire Protection Association, Palmer House, Chicago, Ill.
21-23 Westinghouse Agent-Jobbers Association, The Homestead, Hot Springs, Va.

W. H. RUPPEL, who is Assistant Treasurer of The Potomac Transmission Company, has been elected to a similar capacity with Allegheny Pittsburgh Coal Company, Ohio County Fuel Company, Windsor Coal Company, and Windsor Power House Coal Company.

Following Mr. Hinchman's resignation, Vice-President and Comptroller W. H. Swinney has been elected a Director of West Penn Power Company and President of West Penn Securities Department, Inc.

E. S. MCCONNELL, until recently Engineer on the staff of the Edison Electric Institute, has resigned in order to accept a new position as product manager for aeronautical wires and cables with the United States Rubber Company. His new headquarters will be Rockefeller Center, New York. Mr. McConnell served as Secretary of the Electric Light & Power Group, and of the N.F.P.A. Electrical Committee on the National Electrical Code. He has acted as Secretary for the Institute Meter & Service Committee. Mr. McConnell has been active in committee activities and standardization work pertaining to electric wiring, and has written several papers which have appeared in the E. E. I. BULLETIN.

Georgia Power Company Expanding Service Program

(*Continued from page* 90)

dwindles off to nothing. They will be relieved of many of the minor repairs, however, since these will be taken care of by the customer service representatives and home economists.

To spread the glad tidings of the customer service program among our customers, the service available to them from our customer service representatives and departmental representatives will be published in newspaper advertisements, and generous space in "Round the Home," "Bright Spots" and other company publications, will be devoted to explanation of the company's expanded services. The program will also get promotion in our store windows and on our daily radio program.

The company will also publish a monthly bill stuffer to acquaint customers with the new program.

Economics of War Power Supply

(*Continued from page* 67)

tivity resulting from discontinuance of war activity.

The initial severity of the post-war slack period will, of course, be measured by the degree of dislocation during the war period. It will be a time to try men's courage but it should be relatively short due to the light of future business that will illuminate it. Those justifiable hopes rest on the huge mass of deferred demands that will have been built up during the war and the tremendous development of the determination and ingenuity of the people which the pressure of war will have generated. Based on its many years of experience, the electric power industry may be relied upon to deliver the power that will be needed in the busy postwar era we clearly visualize following the first difficult period of readjustment.

OFFICERS AND COMMITTEES OF THE EDISON ELECTRIC INSTITUTE

1942-1943

OFFICERS

C. W. KELLOGG, *President*
420 Lexington Avenue, New York, N. Y.

PAUL M. DOWNING, *Vice-President*
Pacific Gas & Electric Co., San Francisco, Cal.

H. S. BENNION, *Vice-President & Managing Director*
420 Lexington Avenue, New York, N. Y.

W. E. MITCHELL, *Vice-President*
Georgia Power Co., Atlanta, Ga.

J. C. LEIGHTON, *Treasurer*
Engineers Public Service Co., New York, N. Y.

MAE B. WOODS, *Secretary*
420 Lexington Avenue, New York, N. Y.

OPERATING COMMITTEE

Chairman, C. W. KELLOGG, New York, N. Y.

C. BLACKWELL, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.

B. BRYANS, Philadelphia Electric Co., Philadelphia, Pa.

H. BURKE, Ebasco Services Incorporated, New York, N. Y.

L. CAMPBELL, The Connecticut Light & Power Co., Hartford, Conn.

GE A. DAVIS, Oklahoma Gas and Electric Co., Oklahoma City, Okla.

E. DILLON, Boston Edison Co., Boston, Mass.

L M. DOWNING, Pacific Gas and Electric Co., San Francisco, Calif.

LIAM KELLY, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.

. LEIGHTON, Engineers Public Service Co., New York, N. Y.

NK McLAUGHLIN, Puget Sound Power & Light Co., Seattle, Wash.

E. MITCHELL, Georgia Power Co., Atlanta, Ga.

PH MOODY, Union Electric Co. of Missouri, St. Louis, Mo.

W. C. MULLENDORE, Southern California Edison Co. Ltd., Los Angeles, Calif.

JAMES H. POLHEMUS, Portland General Electric Co., Portland, Ore.

W. H. SAMMIS, The Commonwealth & Southern Corp., New York, N. Y.

CHESTER C. SMITH, Kansas City Power & Light Co., Kansas City, Mo.

PHILIP SPORN, American Gas & Electric Service Corp., New York, N. Y.

E. C. STONE, Duquesne Light Co., Pittsburgh, Pa.

L. V. SUTTON, Carolina Power & Light Co., Raleigh, N. C.

R. L. THOMAS, Consolidated Gas Electric Light & Power Co., Baltimore, Md.

E. S. THOMPSON, American Water Works & Electric Co., New York, N. Y.

G. W. VAN DERZEE, Wisconsin Electric Power Co., Milwaukee, Wis.

H. E. YOUNG, Northern States Power Co., Minneapolis, Minn.

P. S. YOUNG, Public Service Electric & Gas Co., Newark, N. J.

CHAIRMEN OF THE COMMITTEES

dent Prevention, GEORGE S. DIEHL, Pennsylvania Water & Power Co., Baltimore, Md.

unting Executive, F. B. FLAHIVE, Columbia Gas & Electric Corp., New York, N. Y.

omers' Relations, Commercial Accounting and Collections, H. R. FLANEGAN, Philadelphia Electric Co., Philadelphia, Pa.

reciation, H. L. GRUEHN, Consolidated Gas Electric Light & Power Co., Baltimore, Md.

t Accounting and Records, H. P. TAYLOR, Wisconsin Public Service Corp., Milwaukee, Wisc.

hasing Stores and Transportation, W. P. McARDLE, Ebasco Services Incorporated, New York, N. Y.

trical Equipment, R. T. HENRY, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.

ublic Power, E. A. LE FEVER, Susquehanna Electric Co., Conowingo, Md.

rance, J. H. NICKELL, Philadelphia Electric Co., Philadelphia, Pa.

Membership, JAMES F. FOGARTY, The North American Co., New York, N. Y.

Meter and Service, H. A. HOWERY, Kansas City Power & Light Co., Kansas City, Mo.

Prime Movers, J. A. KEETH, Kansas City Power & Light Co., Kansas City, Mo.

Prize Awards, P. S. YOUNG, Public Service Electric & Gas Co., Newark, N. J.

Rate Research, F. A. NEWTON, The Commonwealth & Southern Corp., New York, N. Y.

General Commercial, EDWIN VENNARD, Middle West Service Co., Chicago, Ill.

Statistical, W. G. BOURNE, JR., The Commonwealth & Southern Corp., New York, N. Y.

Transmission and Distribution, E. V. SAYLES, The Commonwealth & Southern Corp., Jackson, Mich.

Codes and Standards (a Subcommittee of the Operating Committee) H. B. BRYANS, Philadelphia Electric Co., Philadelphia, Pa.

BOARD OF TRUSTEES
OF THE
EDISON ELECTRIC INSTITUTE
1942-1943

(*Terms expiring* 1943)

PHILIP G. GOSSLER.....Columbia Gas & Electric Corporation, New York, N. Y.
H. P. LIVERSIDGE.....Philadelphia Electric Company, Philadelphia, Pa.
WILLIAM MCCLELLAN.....Union Electric Company of Missouri, St. Louis, Mo.
K. M. ROBINSON.....The Washington Water Power Company, Spokane, Wash.
P. L. SMITH.....Middle West Corporation, Chicago, Ill.
GEORGE N. TIDD.....American Gas & Electric Company, New York, N. Y.
JOHN E. ZIMMERMANN.....The United Gas Improvement Company, Philadelphia, Pa.

(*Terms expiring* 1944)

D. C. BARNES.....Engineers Public Service Company, New York, N. Y.
SAMUEL FERGUSON .....The Hartford Electric Light Company, Hartford, Conn.
C. E. GROESBECK.....Electric Bond and Share Company, New York, N. Y.
W. J. HAGENAH.....Public Utility Engineering & Service Corp., Chicago, Ill.
EDWARD REYNOLDS.....Columbia Gas & Electric Corporation, New York, N. Y.
E. W. WAKELEE.....Public Service Corporation of New Jersey, Newark, N. J.

(*Terms expiring* 1945)

JAMES B. BLACK.....Pacific Gas and Electric Company, San Francisco, Cal.
J. E. DAVIDSON.....Nebraska Power Co., Omaha, Neb.
JAMES F. FOGARTY.....The North American Company, New York, N. Y.
C. W. KELLOGG.....Edison Electric Institute, New York, N. Y.
B. W. LYNCH.....San Diego Gas & Electric Co., San Diego, Cal
A. C. MARSHALL.....The Detroit Edison Company, Detroit, Mich.
A. B. PATERSON.....New Orleans Public Service Inc., New Orleans, La
H. HOBART PORTER.....American Water Works & Electric Company, Inc., New York, N. Y.
HERBERT A. WAGNER.....Consolidated Gas Electric Light & Power Company of Baltimore, Baltimore, Md.
JUSTIN R. WHITING.....The Commonwealth & Southern Corporation, New York, N. Y.